



DEPARTMENT OF THE NAVY  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
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IN REPLY REFER TO  
OPNAVINST 4700.7K  
N431  
11 JUL 2003

OPNAV INSTRUCTION 4700.7K

From: Chief of Naval Operations

Subj: MAINTENANCE POLICY FOR U.S. NAVY SHIPS

Ref: (a) OPNAVINST 4780.6D, Policy for Administering Service Craft and Boats in the U.S. Navy  
(b) OPNAVINST 4770.5F, General Instructions for Inactive Ships and Craft  
(c) OPNAVNOTE 4700 ser N431H/3U573940 of 16 Jun 03, Representative Intervals, Durations, Maintenance Cycles, and Repair Mandays for Depot Level Maintenance Availabilities of U.S. Navy Ships  
(d) SECNAVINST 5430.80B, Command Relationships When the Coast Guard is Operating as a Service in the Navy  
(e) U.S. Navy Regulations, 1990  
(f) OPNAVINST 4720.2G, Fleet Modernization Program (FMP) Policy  
(g) OPNAVINST 9640.1A, Shipboard Habitability Program  
(h) OPNAVINST 4790.16, Condition-Based Maintenance (CBM) Policy  
(i) SECNAVINST 4790.1, Department of the Navy Maintenance and Material Management  
(j) OPNAVINST 4790.4C, Ships' Maintenance and Material Management (3-M) Policy  
(k) NAVSEAINST 4790.8A, Planned Maintenance System  
(l) MIL-P-24534A, Planned Maintenance System: Development of Maintenance Requirement Cards, Maintenance Index Pages, and Associated Documentation  
(m) NAVSEAINST C9210.30A, Nuclear Reactor Plant Preventive Maintenance and Tender Nuclear Support Facilities Preventive Maintenance on Ships (U)  
(n) CINCLANTFLT/CINCPACFLTINST 4790.3, Joint Fleet Maintenance Manual (JFMM)  
(o) SECNAVINST 4105.1, Integrated Logistics Support (ILS) Assessment and Certification requirements  
(p) SECNAVINST 5000.2B, Implementation of Mandatory Procedures for Major and Non-Major Defense Acquisition

- Programs and Major and Non-Major Information Technology Acquisition Programs
- (q) SECNAVINST 5400.15A, Department of the Navy Research, Development and Acquisition, and Associated Life Cycle Management Responsibilities
  - (r) NAVSEAINST C9210.4A, Changes, Repair and Maintenance to Nuclear Powered Ships (U)
  - (s) NAVSEAINST 9210.14B, Changes to Submarine Tenders and Destroyer Tenders with Nuclear Support Facilities
  - (t) NAVSEA TM S0600-AA-PRO-010, Underwater Ship Husbandry Manual
  - (u) DOD Directive 4151.18, Maintenance of Military Material of 12 Aug 92
  - (v) 10 USC Section 7310, Overhaul, Repair, etc. of Vessels in Foreign Shipyards: Restrictions
  - (w) 10 USC Section 2464, Core Logistics Capabilities
  - (x) 10 USC Section 2466, Limitations on the Performance of Depot-level Maintenance of Materiel
  - (y) 10 USC Section 7299a, Construction of Combatant and Escort Vessels and Assignment of Vessel Projects
  - (z) OPNAVINST 3000.13B, Personnel Tempo of Operations
  - (aa) SECNAV Memorandum of 23 Jul 99, Ship Depot Maintenance Solicitation Policy (NOTAL)
  - (bb) OPNAVINST 4700.38, Berthing and Messing During CNO-Scheduled Availabilities
  - (cc) 10 USC Section 7227, Supplies and Services to Foreign Naval Vessels and Aircraft
  - (dd) OPNAVINST 5430.48D, Office of the Chief of Naval Operations (OPNAV) Organization Manual
  - (ee) Executive Order Number 12344, Feb. 1, 1982, 47 F.R. 4979, Naval Nuclear Propulsion Program
  - (ff) 42 USC Section 7158, Naval Reactor and Military Application Programs
  - (gg) NAVSEAINST C9210.44B, Tenders Supporting Radioactive Work Associated with Naval Nuclear Propulsion Plants Special Radiological Controls and Security Actions for Availabilities in Non-Nuclear Shipyards (U)
  - (hh) OPNAVINST 4441.12C, Retail Supply Support of Naval Supply Activities and Operating Forces
  - (ii) OPNAVINST 5450.194B, Mission and Functions of the Chief of Naval Education and Training (CNET)
  - (jj) OPNAVINST 3120.33B, Submarine Extended Operating Cycle (SEOC) Program
  - (kk) NAVSEA SL790-AC-SPN-010/CMP, Class Maintenance Plan (CMP) Preparation for Surface Ships
  - (ll) SECNAVINST 3960.6, Department of the Navy Policy and Responsibility for Test, Measurement, Monitoring,

Diagnostic Equipment and Systems, and Metrology and Calibration (METCAL)  
(mm) OPNAVINST 4700.8H, Trials, Acceptance, Commissioning, Fitting Out, Shakedown, and Post Shakedown Availability of U.S. Naval Ships Undergoing Construction or Conversion

Encl: (1) Organizational-Level Maintenance  
(2) Intermediate-Level Maintenance  
(3) Depot-Level Maintenance  
(4) Maintenance Programs  
(5) Miniature/Micro-Miniature (2M) Electronic Repair  
(6) Quality Maintenance  
(7) Acronyms and Definitions

1. Purpose. To set policy and establish responsibility for the maintenance of U.S. Navy Ships in accordance with references (a) through (mm). This instruction has been completely revised and should be reviewed in its entirety.

2. Cancellation. OPNAVINST 4700.7J.

3. Scope

a. This instruction applies to all ships and patrol craft of the United States Navy (active and reserve), and those commands responsible for ship and related equipment maintenance with the following exceptions:

(1) Units assigned to the Military Sealift Command (MSC) and the United States Special Operations Command (USSOCOM), through the Navy Special Warfare Command, have their own governing maintenance instructions.

(2) Units designated as service craft and boats are defined in and have their maintenance program administered in accordance with reference (a).

(3) Ships and service craft assigned to the Inactive Fleet have their maintenance program governed by reference (b).

b. Throughout this instruction, the term "ship" refers to all surface ships, aircraft carriers, submarines, and those patrol and service craft specified in reference (c).

c. Ships of the United States Coast Guard (USCG) are covered under this instruction during those times when the USCG operates

as a service in the Navy in accordance with references (d) and (e).

d. Ship maintenance is one of two major components of Navy's program for the maintenance and modernization of ships, which, in its entirety, defines and manages the material condition requirements and the configuration of Navy ships. Navy ship maintenance policies and actions are designed to keep ships at the highest achievable level of material readiness commensurate with supporting the ships while also providing reasonable assurance of their availability for operations to the Fleet Commanders. The second major component, the Fleet Modernization Program (FMP), is designed to maintain the integrity of ship configuration as changes are authorized. While ship maintenance and modernization budgets are distinct, they are closely related in their planning and execution. This instruction addresses policy for the maintenance of Navy Ships, with reference to modernization, as necessary. The Fleet Modernization Program is addressed by reference (f).

e. This instruction provides policy for all three levels of Navy Ship Maintenance: organizational-, intermediate-, and depot-level. Enclosures (1), (2), and (3) respectively, address these maintenance echelons.

#### 4. Policy

a. U.S. Navy ships will be maintained:

(1) In the highest achievable level of material readiness commensurate with supporting the ships mission and availability for operations.

(2) In a safe material condition.

(3) To meet the highest shipboard habitability standards possible for the Fleet Sailor in accordance with reference (g).

(4) To meet governing environmental standards.

b. Maintenance will be performed at the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost.

c. Maintenance procedures and schedules for Navy ships and related equipment are to be developed and performed in accordance

with the Condition-Based Maintenance (CBM) methodology defined in reference (h) whenever practical. The goal is to perform maintenance only when there is objective evidence of actual or predictable failure of a ship's installed systems or components, while ensuring operational readiness, safety, and equipment reliability in a cost effective manner. This will be determined in accordance with Reliability Centered Maintenance (RCM) principles by the command exercising technical authority for the system or component.

c. Maintenance actions shall be either preventive or corrective as defined in enclosure (7).

d. The Navy Ships' Maintenance and Material Management (3-M) System is the Navy's primary management program for non-nuclear maintenance aboard all U.S. Navy ships in accordance with references (i) through (l). Unless prior approval is granted by Chief of Naval Operations (CNO) (N43), other non-nuclear maintenance management programs may not be used.

(1) All organizational-level non-nuclear preventive maintenance actions shall be documented on Maintenance Index Pages (MIPs) in the ship's Planned Maintenance System (PMS) and managed by ship's force in accordance with the 3-M system, references (k) and (l).

(2) Nuclear reactor plant and support facilities preventive maintenance shall be administered by ship's force in accordance with reference (m).

(3) All intermediate- and depot-level preventive maintenance actions shall be documented as Master Job Catalog (MJC) items in the Maintenance Resource Management System (MRMS), or in an alternate Chief of Naval Operations (CNO)-approved maintenance management system, and managed by fleet-designated subordinate activities in accordance with fleet guidelines, reference (n).

(4) Preventive maintenance actions shall be:

(a) Detailed on Maintenance Requirements Cards (MRCs) for organizational-level accomplishment, and as MJC items for intermediate- and depot-level accomplishment.

(b) Scheduled in accordance with the 3-M system for organizational-level accomplishment.

(c) Scheduled in accordance with the Periodic

Maintenance Requirements Scheduling Subsystem of MRMS or an alternate CNO-approved maintenance scheduling system for intermediate- and depot-level accomplishment.

(d) Accomplished as scheduled.

(5) RCM-applicable and RCM-effective corrective maintenance actions may be required to restore systems or equipment to full operation, to bring operation within specified parameters, or to ensure safe operations.

(a) The decision to perform corrective maintenance shall be based on actual equipment condition.

(b) Safety related corrective maintenance is mandatory and shall be accomplished at the earliest opportunity.

(c) The corrective maintenance action selected (i.e., repair, replacement, or alteration) shall be based on optimizing cost and reliability considerations. Execution shall be in accordance with applicable repair or installation standards or specific technical documentation.

e. The Current Ship's Maintenance Project (CSMP) shall be the primary repository of information concerning the material condition of the ship and shall be maintained by ship's force in a complete and current status at all times in accordance with reference (k).

(1) The CSMP shall be used by the ship to document all deferred preventive and corrective maintenance requirements regardless of the source of the requirements. These deferred items shall be validated by ship's force and entered into the CSMP in accordance with reference (k) guidelines.

(2) The CSMP shall include deferred material deficiencies reported by headquarters or fleet inspections such as Underwater Ship Husbandry (UWSH) Inspections, Underway Material Inspections (UMIs). Where practical, deficiencies identified from these inspections should be provided to the ship in electronic format compatible with CSMP automated format to avoid imposition of laborious data entry requirements on ship's force.

f. A tailored maintenance program shall be developed and maintained for each ship class. It will provide details on all essential maintenance elements required for the ship class to be kept in a high state of material readiness. It will be based on

CBM methodology using RCM principles in accordance with reference (h) and will include all preventive maintenance actions (organizational-, intermediate-, and depot-level) with engineered periodicities as required. The plan will also specify key elements such as: depot-level availability notional intervals and durations, frequency of intermediate-level availabilities, and any special maintenance, maintenance support, or infrastructure requirements. Maintenance will be integrated with the ships Inter-Deployment Training Cycle (IDTC) schedule. Depot level maintenance should normally occur prior to the basic phase of training. Follow-on intermediate-level maintenance periods will mesh with the ships operational schedule. The maintenance program shall be submitted to Commander, Naval Sea Systems Command (COMNAVSEASYSCOM) and the CNO Ship's Resource Sponsors (N42, N75, N76, N77, or N78) for review and approval. All changes will be reviewed and approved as required by the applicable CNO Ship's Resource Sponsor prior to being applied to the ship class. Details concerning development and implementation of a maintenance program are provided in enclosure (4). The maintenance program for each ship class shall:

(1) Provide a general overview of the responsible Program Executive Office's (PEO's), Direct Reporting Program Manager's (DRPM's), or Ship Program Manager's (SPM's) maintenance plan for the ship class.

(2) Emphasize the accomplishment of maintenance actions performed on a continuous basis throughout the ship's life cycle, using RCM and CBM principles. Ideally, the maintenance process is a near continuous flow of maintenance candidates to the most appropriate level and maintenance activity for accomplishment. Timed to best support operations, screening, planning and executing maintenance migrates from a centralized timed-based batch process to a decentralized, condition-based nearly continuous process.

(3) Provide a selection of special support alternatives (e.g., rotatable pools, insurance item management, or dedicated maintenance husbandry agents, such as Port Engineers or AEGIS Homeport Engineering Teams) whose use would be determined through the evaluation of technical and economic criteria.

(4) Minimize the time ships spend in depot maintenance by ensuring that depot maintenance availability notional intervals and durations are an integral part of both the acquisition and the life-cycle maintenance strategy for ships, and are determined by maintenance requirements, and not by anticipated modernization

requirements. The installation of new alterations should be planned and scheduled to conform to these notional depot maintenance intervals and durations. Actual availability durations will be altered as necessary to accomplish all required maintenance and modernization actions.

(5) Ensure that ships are as self-sufficient in accomplishing maintenance as practical within the limits of specified maintenance requirements and within the limits of established Navy policy regarding crew workload. The Navy should drive increasingly toward "one way of doing business" for ship maintenance, authorizing variances only where a compelling case is made and approved. Self-sufficiency shall not be interpreted as authorization or direction to independently develop and support class or ship-unique maintenance processes, or information systems. Within the framework of this vision, maintenance programs shall utilize the following resources enhancing self-sufficiency:

(a) Reliable on-site or on board technical decision-making support programs, such as the Miniature/Micro miniature (2M) Electronic Repair Program, described in enclosure (5).

(b) Accurate technical information and data about system and equipment performance requirements, operating procedures, and maintenance and repair technical requirements and procedures. The key to this is the effectiveness of the Integrated Logistic Support (ILS) program and the manner in which that program is integrated into the larger Navy maintenance infrastructure.

(c) Effective processes and tools to minimize the labor hours required to: identify, locate, extract, and apply information and data required to perform work correctly the first time, and to accurately report work completion data.

g. Fleet Maintenance Activities (FMAs) are fleet assets to be utilized for accomplishment of maintenance and modernization that is beyond organizational-level capability or capacity, but not requiring depot-level assets. Intermediate-level maintenance is addressed further in enclosure (2).

h. The primary function of a Shore Intermediate Maintenance Activity (SIMA) is to train Sailors in Battle Force Intermediate Maintenance Activity (BFIMA) core skills using the Navy Afloat Maintenance Training Strategy (NAMTS). This primary function of training Sailors applies to all other FMAs when Sailors are



assigned. BFIMA/NAMTS relies on skill training and proficiency for enlisted ratings that repair and maintain shipboard systems to ultimately enhance fleet readiness and ship self-sufficiency as discussed in enclosure (2).

i. Navy commands responsible for ship and related equipment maintenance will promote, develop, and utilize existing and emerging technologies to increase maintenance efficiencies and quality assurance; promote shipboard safety and habitability; enhance environmental protection; and reduce costs. Maintenance of equipment and material will be performed at all maintenance levels:

(1) By qualified personnel.

(2) Using technically approved procedures issued by the appropriate technical authority.

(3) Following approved safety procedures.

(4) Based on the objective evidence of need as prescribed by the CBM Methodology and developed by application of RCM principles.

(5) In a cost-effective manner.

(6) Meeting applicable specifications.

(7) In accordance with Quality Assurance Standards.

j. Maintenance of ship systems and equipment shall be performed by qualified personnel using correct procedures and material in accordance with technical requirements issued by the appropriate technical authority. Policy and direction issued by the Fleet Commanders (FLTCs), COMNAVSEASYS COM, or their subordinate activities shall comply with required technical requirements. FLTCs and COMNAVSEASYS COM shall ensure procedures addressing deviations to technical requirements are established. These procedures shall:

(1) Ensure that the activity, when finding itself unable to comply with technical requirements, recommends to the appropriate technical authority a repair that the activity considers achievable and which will ensure the needs of the fleet are satisfied.

(2) Differentiate between categories of repair, and identify, by each category of repair, the appropriate technical

authority that can authorize deviation from technical requirements.

(3) Ensure work does not proceed until concurrence from appropriate technical authority is received.

(4) Ensure that the responsible technical authority revises applicable technical requirements, or documents a deviation from technical requirements, to reflect resolution of the repair.

k. Depot maintenance activities perform maintenance and modernization work that is beyond intermediate-level capability or capacity. Depot-level maintenance is addressed in enclosure (3).

l. Ship configuration shall be controlled through a formal change process that provides for updating of the Ship's Configuration and Logistics Support Information System (SCLSIS) database. All changes to ship configuration shall be in accordance with specified requirements as approved by the appropriate technical authority. Equipment and components installed in Navy ships shall be standardized to the maximum extent practicable to minimize life cycle logistics support costs. This means that maintenance and modernization changes, as well as new construction changes, should emphasize the use of equipment and components already supported by the Federal Supply System to the maximum extent practicable, with due consideration to life cycle cost, reliability, and maintainability.

m. Effective Integrated Logistics Support (ILS) and the resources required to implement the maintenance program over the life cycle of each new ship class shall be programmed and budgeted in sufficient time to ensure that support is in place by no later than the end of the lead ship's post-shakedown availability. For systems being introduced for in-service ships, ILS resources shall be programmed and budgeted to ensure support is in place coincident with fleet introduction in accordance with references (o) through (q).

n. Repairs, maintenance, and modernization of the propulsion plants in nuclear powered warships involve unique considerations for technical and quality control, ship safety, radiological controls for occupational health and safety, and information security. Accordingly:

(1) Reactor plant maintenance, repair, and modernization

in nuclear powered warships, beyond the capability or capacity of the organizational level, shall be assigned only to nuclear capable shipyards or nuclear capable intermediate maintenance activities and performed following the requirements established by the Director of Naval Nuclear Propulsion Program (CNO (N00N)), COMNAVSEASYS COM (SEA 08)).

(2) Depot-level repair, maintenance, and modernization for steam plant systems, electric plant systems, and those auxiliary ship systems, which support reactor plant, and associated reactor safety systems in nuclear-powered warships shall be assigned only to nuclear-capable shipyards and performed per requirements established by COMNAVSEASYS COM.

(3) Changes, repairs, and maintenance in the nuclear propulsion plants of nuclear-powered warships shall be in strict accordance with reference (r).

o. Changes, repairs, and maintenance in the nuclear support facilities of nuclear-capable tenders shall be in strict accordance with reference (s).

p. Dry dockings shall be planned and scheduled in accordance with the ship's approved maintenance program. Underwater Ship Husbandry (UWSH) inspection, maintenance, or repair actions shall be planned and accomplished in accordance with reference (t).

(1) In the event drydocking maintenance actions are required before planned, a review of current UWSH capabilities shall be undertaken by the responsible repair activity to determine if drydocking is necessary or if emergent drydock time can be reduced cost effectively, by accomplishing repairs with qualified divers using approved procedures.

(2) Whenever feasible, UWSH maintenance actions should provide permanent repairs to avoid subsequent drydock rework costs. Where permanent repairs are not feasible, temporary repairs shall be accomplished, within technical and cost constraints, to support ship operations until the next regularly scheduled drydocking.

q. In accordance with references (u) and (v), depot maintenance, in support of deployed weapons systems, may be performed within the theater of deployment when necessary. Depot maintenance performed overseas: must be cost effective, must not adversely impact the U.S. industrial base (public or private), and must comply with existing statutes. Therefore, Navy's

overseas ship maintenance policy is:

(1) Overseas homeported ships. Depot maintenance for ships being prepared for, or returning from, homeporting overseas will be scheduled to maximize the use of the industrial capacity of the United States. During the 15-month period preceding its planned reassignment to a homeport in the United States, or a territory of the United States, only depot availabilities less than 6 months in duration may be scheduled.

(2) U.S. or U.S. territory homeported ships. In accordance with reference (v), only voyage repair availabilities defined in subparagraph 1.i. of enclosure (3) may be performed on U.S. or U.S. territory homeported ships by shipyards or ship repair facilities (SRFs) located outside of the United States or its territories. For the purposes of this prohibition, a shipyard is any facility that repairs naval vessels and is located outside the United States or its territories.

r. Assignment of a specific ship availability to a public or private shipyard shall be based on complexity of work, as well as consideration of maintaining both public and private sector capability at an adequate level for Navy's current and future maintenance, modernization, and emergency ship repair requirements in accordance with references (w) through (y).

s. To comply with personnel tempo of operations (PERSTEMPO) requirements established in references (z), CNO-scheduled private sector depot-level availabilities of 6 months duration or less shall be solicited to be accomplished in the ship's homeport area, or cluster, or as close to same as is required to ensure adequate competition, capacity, and capability in accordance with reference (aa).

t. To minimize negative impact on ship's force quality of life:

(1) CNO availabilities solicited coast wide, which may be awarded for out-of-homeport accomplishment, shall be planned and solicited to support contract award no less than 120 days prior to scheduled start.

(2) CNO availabilities solicited in an extended solicitation area, which may be awarded for out-of-homeport accomplishment, shall be planned and solicited to support contract award no less than 60 days prior to scheduled start.

u. The Navy's ship maintenance and technical communities

will, where practical, develop and maintain comprehensive material condition readiness metrics capable of providing an objective measure of the true material condition of ships in the Fleet to OPNAV and Fleet Commanders. The metrics, agreed upon by OPNAV, NAVSEASYSKOM, and Fleet Commanders, will provide resource sponsors and maintenance managers the ability to utilize material condition information to support planning and execution of maintenance programs. The objectives of this effort are to ensure that approved maintenance plans are adequately implemented, to identify potential improvements to the maintenance plan, to provide a means of predicting the impact of various levels of maintenance funding on future ship material condition and readiness, and to ensure ships are maintained in the highest achievable level of material readiness commensurate with supporting the ships mission and availability for operations.

v. The Navy's ship maintenance and technical communities will collaborate with the Board of Inspection and Survey (INSURV) to develop and maintain Fleet-wide standardized assessment procedures and criteria to determine the ship system and equipment material readiness metrics discussed in paragraph 4.u. above. OPNAV, NAVSEASYSKOM, Fleet Commanders, and Type Commanders will use the results of these inspections for readiness assessment and maintenance budgeting purposes.

w. Ship maintenance programs and technical issues having the largest impact on fleet readiness and requiring senior Navy leadership attention for resolution, are to be managed and tracked to satisfactory completion by one management system (the Top Management Attention/Top Management Issues (TMA/TMI Program). The Naval Sea Systems Command will coordinate the TMA/TMI Program for all systems commands and program offices, with Fleet maintenance personnel prioritization and participation.

x. The CNO, Systems Commands (SYSKOM), Fleet Commanders, and Type Commanders will develop and maintain Navy-wide standard business processes for scheduling, tracking, and funding ship maintenance, authorizing variances only where a compelling case is made and approved by the level in the chain of command with oversight authority.

y. Navy engineering, acquisition, maintenance activities, Fleets, and operational commands shall actively promote equipment standardization in the Fleet.

z. Ship configuration shall be controlled through a formal

change process that provides for updating of the Ship's Configuration and Logistics Support Information System (SCLSIS) database. Equipment and systems placed on Navy ships will be fully documented in the ship's configuration record by the command responsible for conducting the installation or change. This command is also responsible for ensuring that government-contracted operating and maintenance training is conducted, and supply support (Integrated Logistics Support (ILS)) is fully in-place at system Initial Operational Capability (IOC) per references (o) and (p). The ship's commanding officer shall ensure that the configuration is validated and recorded in accordance with procedures of reference (k).

aa. Messing and berthing during CNO scheduled maintenance availabilities is a significant quality of life issue (reference (bb)). During availabilities when the ship is declared uninhabitable, those crew members not already receiving basic allowance for quarters (BAQ) will be berthed in adequate quarters as determined by the Fleet Commander in accordance with reference (bb).

bb. Maintenance of foreign vessels may be performed by Fleet Maintenance Activities (FMAs) and naval shipyards if similar supplies and services are furnished on a like basis to naval vessels and military aircraft of the United States by the foreign country concerned. Maintenance of foreign vessels must be on a not-to-interfere and cost reimbursable basis and must be approved in each instance by CNO (N43) prior to the commencement of work in accordance with references (e) and (cc).

cc. Navy maintenance planning activities are to promote and support standard and reusable planning documents through use of the Ship Availability Planning and Engineering Center (SHAPEC) process and products, for those ship classes covered under this process.

## 5. Responsibilities

a. CNO. The CNO is responsible for maintaining the overall readiness of naval forces as prescribed in references (e) and (dd). This includes the responsibility for planning and programming resources required for the acquisition, life cycle management, maintenance, and modernization of Navy ships.

(1) Director of Naval Nuclear Propulsion Program (CNO (NOON)), COMNAVSEASYS COM (SEA 08). References (m, r, s, dd, ee, ff, and gg), establish the responsibilities and authorities of

the Director of Naval Nuclear Propulsion Program, CNO (N00N), who is also the Deputy Commander, Naval Sea Systems Command (NAVSEA 08), and Deputy Assistant Secretary for Naval Reactors, Department of Energy (DOE). The Director has responsibility for and directs all aspects over all facilities and activities that comprise the Navy Nuclear Power program, a joint Department of Energy (DOE), and Navy organization. These responsibilities and authorities include all matters pertaining to the maintenance, repair, and modification of naval nuclear propulsion plants and associated nuclear capable support facilities. Nothing in this instruction supersedes or changes these responsibilities and authorities. Accordingly, the Naval Nuclear Propulsion Directorate will be consulted in all matters pertaining to or affecting the maintenance, repair, and modification of naval nuclear propulsion plants and associated nuclear support facilities.

(2) Deputy Chief of Naval Operations (Fleet Readiness and Logistics), (CNO (N4)), is the principal advisor and executive to the CNO on the assessment of Navy readiness and logistic affairs for the operating forces and shore establishment in accordance with reference (s). This includes the oversight of ship maintenance. CNO (N4):

(a) Acts as the OPNAV assessment sponsor for ship maintenance programs and intermediate- and depot-level Maintenance Activities.

(b) Develops Navy-wide ship maintenance policy and goals in coordination with platform sponsors.

(c) Ensures ship maintenance programs are integrated, compatible, and effective.

(d) Coordinates preparation and presentation of all ship maintenance requirements through all phases of the Navy's Planning, Programming and Budgeting System (PPBS) and review.

(e) Coordinates and approves fleet depot-level availability schedules, working with FLTCs, SYSCOMs (e.g. Commander, Naval Air Systems Command (COMNAVAIRSYSCOM), Commander, Space and Naval Warfare Systems Command (COMSPAWARSYSCOM), NAVSEASYSYSCOM, and Commander, Naval Supply Systems Command (COMNAVVSUPSYSCOM), their affiliated PEOs, and resource sponsors.

(3) Director, Fleet Readiness Division (CNO (N43)), is

the CNO staff (OPNAV) point of contact for all ship maintenance and Fleet readiness issues that cross Ships' Resource Sponsor boundaries in accordance with reference (s). CNO (N43) will:

(a) Serve as CNO (N4)'s Lead for the ship maintenance responsibilities listed above.

(b) Coordinate ship maintenance programs with the OPNAV Ships' Resource Sponsors (N42, N75, N76, N77, and N78), FLTCs, COMNAVSEASYSCOM, PEOs, and Direct Reporting Program Managers (DRPMs), as required.

(c) Concur with all ship maintenance Programs prior to approval by cognizant OPNAV Ships' Resource Sponsors.

(d) Assess ship maintenance requirements, identify funding and other program deficiencies, and recommend resolutions to properly execute ship maintenance.

(e) With input from COMNAVSEASYSCOM, FLTCs, and Type Commanders, document, via reference (c), approved representative intervals, durations, maintenance cycles, and repair mandays for depot-level maintenance availabilities to be used for scheduling, programming, and budgeting purposes.

(f) Approve the location and dates of all CNO-scheduled depot maintenance availabilities. Reviews assigned work to ensure core capabilities are maintained.

(4) OPNAV Ships' Resource Sponsors (CNO N42, N75, N76, N77, and N78), in accordance with reference (dd) will:

(a) Review, approve, and monitor Maintenance Programs for their respective platforms, including Naval Reserve Force (NRF) ships.

(b) Plan and program the resources required to support maintenance plans as well as modernization to resolve equipment obsolescence issues in accordance with the Navy Program Planning and Budgeting System (PPBS) guidance.

(c) Review all CNO-scheduled depot availability changes prior to CNO (N43) approval.

(d) Define requirements for ship material condition metrics discussed in paragraph 4u. Plan and program the resources required to develop and maintain ship material condition metrics.



(5) The Deputy Chief of Naval Operations (Manpower and Personnel), CNO (N1), will provide trained, qualified military personnel to perform maintenance at all levels in accordance with reference (s).

b. FLTCs. The FLTCs are responsible for the material condition of their assigned ships in accordance with reference (e). The FLTCs shall:

(1) Identify and authorize required maintenance actions, using condition, cost, schedule, and mission trade-offs, as required.

(2) Ensure that ship's force, FMA, and SRF maintenance actions are planned and accomplished by qualified personnel using correct procedures and materials in accordance with cognizant technical requirements.

(3) Approve those changes to CNO-scheduled depot maintenance availabilities authorized by enclosure (3).

(4) Implement standard maintenance policies between the Atlantic and Pacific fleets in accordance with reference (n).

(5) Participate in the development and implementation of the maintenance program for each ship class.

(6) Promote self-sufficiency of fleet ships and activities.

(7) Fund ship systems Direct Fleet Support (DFS) services provided by NAVSEASYS COM and its subordinate activities on a cost reimbursable basis.

(8) Provide feedback of resource expenditures and as-found material condition to the 3-M System. Resource expenditure feedback is required in detail sufficient for continuous improvement of depot-level planning, programming, and budgeting. As-found material condition feedback is required in detail sufficient to support refinement and validation of technical requirements, to perform engineering analysis, and to schedule subsequent maintenance actions.

(9) Comply with additional responsibilities issued in enclosures to this instruction.

(10) Establish and manage procedures to approve and track the maintenance of foreign vessels as discussed in paragraph 4dd.

c. Fleet Type Commanders (TYCOMS), are responsible to their FLTC for the material condition of their assigned ships. The TYCOMs shall:

(1) Carrying out the maintenance policies of OPNAV and their respective FLTC.

(2) Providing mission-ready ships of their type to operational commanders, within the funding authorized by the resource sponsor.

(3) Managing emergent and scheduled maintenance for ships of their type, including the identification and prioritization of corrective maintenance actions and maintenance alterations on the ships of their type.

(4) Advising their respective FLTC and NAVSEASYS COM on standardization of maintenance and modernization processes and products.

(5) Managing maintenance resources as directed by their respective FLTC, including developing Program Objective Memorandum (POM) and budget requirements for ship maintenance.

d. COMNAVSEASYS COM, as the lead systems commander for ship in service support in accordance with reference (q) shall:

(1) Oversee the core processes required to support in service support of ships in accordance with reference (q). Be the lead technical authority, along with the affiliated PEOs, in the development and management of Maintenance Programs for each ship class (active and reserve) to ensure that U.S. Navy ships are maintained in the highest possible state of material readiness. COMNAVSEASYS COM will ensure Maintenance Programs are updated as changes occur.

(2) Establish hull, mechanical, and electrical (HM&E) and combat systems technical requirements and provide the technical support necessary to maintain the material condition of all ships.

(3) Develop and maintain measures of ship material condition that monitor the effectiveness of maintenance programs.

(4) Command the Naval Shipyards and Supervisors of Shipbuilding, Conversion, and Repair (SUPSHIPS).

(5) Oversee and manage standardization of maintenance and

modernization processes and products in support of the Navy's drive toward "one way of doing business" for ship maintenance. This includes ensuring the use of CBM and RCM in the development and update of maintenance programs.

(6) Establish standard policy and procedures to maintain configuration documentation on all U.S. Navy Ships. Ensure coordination in configuration documentation with other systems commands and PEOs for equipment and materiel under their cognizance.

(7) Ensure that Naval Supervising Activities (NSAs) (For CNO Scheduled Availabilities, typically the Naval Shipyards (NSYs) and Supervisors of Shipbuilding, Conversion and Repair (SUPSHIPS)) integrate all maintenance providers involved in the execution of CNO-scheduled availabilities to ensure that ship maintenance and modernization are performed within the scope of work authorized, employing prescribed technical and quality standards, specifications, and requirements in an efficient and cost effective manner.

(8) Furnish timely information on the prospective workloads of NSYs and SUPSHIPS to the respective FLTCs for their guidance, recommending changes to scheduled availabilities to balance workload and avoid excessive cost to the Navy.

(9) Issue and maintain current Navy drawings, Job Skill Qualification Requirements, technical manuals, repair standards, maintenance and test requirements, and process controls as required for ship, system, and equipment operation and maintenance.

(10) Assist and advise FLTCs and TYCOMs in Condition-Based Maintenance implementation.

(11) Develop RCM-based material condition diagnostic systems needed for more effective maintenance decision-making, and develop or integrate information systems required to support increased maintenance self-sufficiency of ships and other fleet activities.

(12) Manage and provide technical oversight for the Navy Ships' Maintenance and Material Management (3-M) Program in accordance with the policies prescribed in references (j) and (k).

(13) Provide ship system Direct Fleet Support (DFS) services on a cost-reimbursable basis as requested by the FLTCs.

This support includes advice, instruction, and training of fleet personnel under the operational control of Fleet Commanders. It also includes reviews, tests, and inspections to evaluate the effectiveness and material condition of ship equipment and systems.

(14) Identify, through close contact with the Fleet and the other systems commands, maintenance-training requirements. Work with the Commander, Naval Education and Training Command (COMNETC) to develop training courses and material as required.

(15) Support OPNAV and FLTCs in the development and maintenance of comprehensive material condition metrics capable of providing an objective measure of ship's true material conditions as prescribed by CNO N43 and Resource Sponsors and discussed in paragraph 4v.

(16) Develop, manage, and maintain a single program with the Fleets (TMA/TMI) to track the resolution of critical Fleet maintenance and technical issues that require attention of senior Navy leadership for resolution as discussed in paragraph 4w.

(17) Analyze maintenance feedback to determine design and process improvements in order to refine maintenance requirements.

(18) Comply with additional responsibilities issued in enclosures to this instruction.

e. Deputy Commander, Naval Sea Systems Command (NAVSEA 08). NAVSEA 08, as Director, Naval Nuclear Propulsion, is responsible for all matters pertaining to the maintenance, repair, and modification of naval nuclear propulsion plants and associated nuclear capable support facilities as cited in subparagraph 5a(1).

f. PEOs, DRPMs, and SPMs. PEOs, DRPMs, and SPMs are responsible for all aspects of life cycle management of their assigned programs in accordance with reference (q). They will report directly to CNO through COMNAVSEASYS COM for matters pertaining to in service support. They shall:

(1) Assist and advise FLTCs and TYCOMs in condition-based maintenance implementation.

(2) Develop RCM-based material condition diagnostic systems needed for more effective maintenance decision-making, and develop or integrate information systems required to support increased maintenance self-sufficiency of ships and other fleet

activities.

(3) Issue and maintain current selected record data, ship drawings, and ship-class-specific technical manuals.

(4) Analyze in-service operational data and maintenance feedback through 3-M maintenance data, casualty reports, repair activity discrepancy reports, guarantee and warranty deficiencies and other reporting sources to determine design and process improvements and to refine maintenance requirements.

(5) Consider optimizing operational readiness through the use of embedded diagnostics and prognostics, serialized item management, automatic identification technology (AIT), and iterative technology refreshment where cost effective.

(6) Approve those changes to CNO-scheduled depot maintenance availabilities authorized by enclosure (3).

(7) Comply with additional responsibilities issued in enclosures to this instruction.

g. COMNAVAIRSYSCOM, COMSPAWARSYSCOM, and Commander, Marine Corps Systems Command (COMARCORSYSCOM). These Commands shall coordinate with COMNAVSEASYSYSCOM in the performance of their assigned duties for the maintenance and modernization of ships and related equipment in accordance with reference (q):

(1) Maintain their assigned systems and associated equipment in the highest state of material condition.

(2) Provide NSYs, SUPSHIPS, and FLTCs the technical support necessary to perform quality maintenance. This support is to be coordinated with COMNAVSEASYSYSCOM.

(3) Analyze maintenance feedback to determine design and process improvements in order to refine maintenance requirements.

(4) Provide DFS services as requested by FLTCs.

(5) Coordinate with COMNAVSEASYSYSCOM to promote, manage, and maintain configuration documentation for all U.S. Navy Ships.

(6) Provide technical assistance to COMNAVSEASYSYSCOM in the development of comprehensive material condition metrics capable of providing an objective measure of ship's true material conditions as discussed in paragraph 4v.

(7) Comply with additional responsibilities issued in enclosures to this instruction.

h. COMNAVSUPSYSCOM. COMNAVSUPSYSCOM is responsible to provide and position material in accordance with approved planning data and a logistically supported maintenance concept to achieve operational readiness goals. COMNAVSUPSYSCOM will utilize configuration and technical information provided by the other Systems Commands when determining material requirements. COMNAVSUPSYSCOM shall:

(1) Issue supply management policy and procedures as required to support material procurement and control.

(2) Determine supply allowances and requirements at all echelons of supply in accordance with reference (hh), which addresses readiness based sparing policy.

(3) Provide a system and procedures to support spare parts accountability.

(4) Ensure standard stock materials are procured and available to support intermediate and depot maintenance availability schedules.

(5) Comply with additional responsibilities issued in enclosures to this instruction.

i. Chief of Naval Personnel (CHNAVPERS). CHNAVPERS is responsible for providing trained, qualified, military personnel as specified by current manpower authorization, to perform organizational- and intermediate-level maintenance.

j. COMNETC. COMNETC shall provide effective training in maintenance skills for military personnel in accordance with reference (ii) and modify training programs to enhance quality maintenance as described in enclosure (6). RCM, CBM, and quality maintenance concepts and methods shall be included in shipboard watchstanders, equipment operators, maintainers, supervisors, planners, and engineering training programs.

k. Commander, Naval Reserve Force (COMNAVRESFOR). COMNAVRESFOR shall coordinate efforts with the FLTCs to optimize the productivity and contribution of the Selected Reserve to the Fleet's maintenance requirements.

l. Ships' Commanding Officers (COs). Ensure the proper preservation, repair, maintenance, and operation of any ship

under his or her command in accordance with reference (e).  
Ensure proper reporting and documentation of all maintenance and modernization in accordance with reference (j) and (k).

6. Report. Reporting requirements contained in enclosure (3) paragraph 2c are exempt from reports control per SECNAVINST 5214.2C.

S/

K. F. Heimgartner  
Rear Admiral  
Director, Fleet Readiness  
Division

Distribution:

SN DL A1F (ASSTSECNAV FMC)  
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23 (Force Commanders)  
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26B3 (Reserve Forces Command)  
26E (Amphibious Unit)  
26F (Operational Test and Evaluation Force)  
26J (Afloat Training Group and Detachment)  
26L (Priority Material Office and Detachment)  
26T (Regional Support Group and Organization)  
26U (Regional Maintenance Center)  
26Z (Shore Intermediate Maintenance Activity and Detachment/Naval Reserve Maintenance Facility)  
26BB (Fleet CSOSS Development and Implementation Team)  
26MM (Fleet Integrated Logistics Overhaul Activity and Team)  
26VV (Submarine Force Shipyard Representative)  
28 (Squadron, Division and Group Commanders - Ships)

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- 29 (Warships)
- 30 (Mine Warfare Ships)
- 31 (Amphibious Warfare Ships)
- 32 (Auxiliary Ships)
- 41A (Commander Military Sealift Command)
- 41B (Area commanders, MSC)



B5 (Coast Guard)  
C28D (Fleet Technical Support Center Atlantic Detachment)  
C31B (Fleet Technical Support Center Pacific Detachment)  
C31F (Maintenance Detachment)  
C31G (Ship Repair Facility Detachment, PAC)  
C81B (Space and Naval Warfare Systems Center Detachment)  
C84 (Shore Based Detachments, SEASYS COM) (Less C84J)  
FA13 (Submarine Support Facility)  
FA50 (Trident Refit Facility, LANT)  
FA8 (Fleet Technical Support Center, LANT)  
FB13 (Submarine Base PAC)  
FB29 (Naval Intermediate Maintenance Facility, PACNORWEST)  
FB8 (Fleet Technical Support Center, PAC)  
FB30 (Ship Repair Facility)  
FC5 (Support Activity EUR)  
FF5 (Safety Center)  
FI1 (Special Warfare Center)  
FF8 (Inspection and Survey Board)  
FF42 (Postgraduate School)  
FKA1A (Air Systems Command)  
FKA1B (Space and Naval Warfare Systems Command)  
FKA1F (Supply Systems Command)  
FKA1G (Sea Systems Command)  
FKA8F (Strategic Systems Programs)  
FKM9 (Fleet and Industrial Supply Center)  
FKM14 (Inventory Control Point)  
FKM17 (Supply Information System Activity)  
FKP (Naval Sea Systems Command Field Activities)  
FKR6A (Air Warfare Center Aircraft and Training Systems  
Division)  
FT22 (Fleet Combat Training Center)  
FT28 (Education and Training Center)  
FT30 (Service School Command)  
FT31 (Training Center)  
FS1 (Intelligence)  
FT1 (Chief of Naval Education and Training)  
FT43 (Surface Warfare Officers School Command)  
FT88 (Engineering Duty Officer School)

CNO (00N, N095, N40, N41, N43, N8, N75, N76, N765, N766, N77,  
N771, N78, and N785)

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## ORGANIZATIONAL-LEVEL MAINTENANCE

1. Definition. Organizational-level maintenance is the lowest maintenance echelon and consists of all maintenance actions within the capability of ship's force.

### 2. Policy

a. Maintenance will be performed at the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost. Accordingly, organizational-level maintenance may be assigned to higher maintenance echelons.

b. Typical organizational-level maintenance actions include, but are not limited to, such items as:

(1) Facilities maintenance, such as cleaning and preservation.

(2) Routine systems and component preventive maintenance, such as inspections, systems operability tests and diagnostics, lubrication, calibration, and cleaning.

(3) Corrective maintenance, such as hull, mechanical, electrical, and electronic troubleshooting down to the lowest replaceable unit level, miniature and microminiature (2M) electronic repair, and minor repairs to components to restore operation.

(4) Assistance to higher level maintenance activities.

(5) Verification and quality assurance of maintenance accomplished by other activities.

(6) Documentation of all deferred and completed maintenance actions, whether accomplished by ship's force or by other activities.

### 3. Responsibilities

a. The Ship's Commanding Officer. The ship's commanding officer is responsible for the proper preservation, repair, maintenance, and operation of his or her ship, in accordance with article 0834 of reference (e), and for cost effective management

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of required maintenance actions. The ship's commanding officer shall:

(1) Ensure ship's force accomplishment of organizational-level maintenance actions.

(2) Ensure that quality maintenance is performed by other activities by providing assistance and oversight, as necessary, to ensure that published quality assurance standards are adhered to.

(3) Document all maintenance actions in accordance with reference (k), whether accomplished by ship's force or by other activities.

(4) Ensure the Current Ship's Maintenance Project (CSMP) is maintained in a complete and up-to-date status.

INTERMEDIATE-LEVEL MAINTENANCE

1. Definition

a. Maintenance requiring a higher skill, capability, or capacity than that of the organizational-level.

b. Intermediate-level maintenance is normally accomplished by Navy Fleet Maintenance Activity (FMA) personnel on or at tenders, aircraft carriers, Aircraft Intermediate Maintenance Departments (AIMDs), submarine refit and support facilities (e.g., Trident Refit Facilities (TRFs), Naval Submarine Support Facility New London, and Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY & IMF)), Shore IMAs (SIMAs), ship repair facilities, regional repair facilities or Battle Force Intermediate Maintenance Activities (BFIMAs). Within the limits of each FMA's personnel (numbers, skills, and levels of training) and facilities (shops, docks, machinery, and diagnostics equipment), FMAs perform those corrective and preventive maintenance, repair, alteration, installation, quality assurance, calibration, testing, and related functions on hull, mechanical, and electrical (HM&E), and combat equipments and systems which are beyond the capability or capacity of the customer. This definition applies specifically to those intermediate-level maintenance functions required to support ships. FMAs are Fleet Commander (FLTC) assets.

c. Fleet Maintenance Availability (FMAV). An FMAV is an FMA availability for the accomplishment of maintenance and alterations. FMAVs may be scheduled or emergent, and may be further categorized based on scope, location, and type. During these availabilities, the ship may be rendered incapable of fully performing its assigned mission and tasks due to the nature of the repair work. FMAVs are assigned by the FLTC or his authorized representative.

2. Mission

a. FMAs (afloat and ashore). FMAs:

(1) Perform intermediate-level maintenance and provide related support to ships.

(2) Provide in-rate training and experience for enlisted ratings that repair and maintain shipboard systems. These trained personnel enhance fleet readiness and ship self-

sufficiency.

(3) Provide in-rate training and experience for assigned Selected Reserve units.

b. Tenders (ASs). In addition to subparagraph 2a, tenders, because of their mobility, also:

(1) Provide capability for repair of battle damage and other emergent repairs to forward deployed operating forces, when required.

(2) Provide redeployment capability between theaters to complement the movement of operating forces.

c. Shore Intermediate Maintenance Activities (SIMAs). SIMA's in addition to subparagraph 2a, also:

(1) The in-rate training and experience provided for enlisted personnel is focused on Battle Force Intermediate Maintenance Activity (BFIMA) core skills using production work under the Navy Afloat Maintenance Training Strategy (NAMTS).

(2) Provide a mobilization option for wartime maintenance and battle damage repair.

(3) Provide billets co-located with Naval Reserve Force (NRF) ships to support Training and Administration of Reserve (TAR) personnel sea/shore rotation and retention.

(4) During peacetime, train Selected Reserve (SELRES) personnel assigned to billets on Type III NRF frigates in ship maintenance functions. This training is to enhance and maintain individual rating proficiency. Upon mobilization, these SELRES shall report to their assigned ships.

### 3. Policy

a. In keeping with the policy of performing maintenance at the echelon level that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost.

(paragraph 4b of the basic instruction), FMAs should be utilized to the maximum extent practicable. All FMAs are authorized, within the limits of capability and capacity, to perform work that is classified as organizational-level, but is not feasible

or practicable for ship's force to accomplish because of time or personnel constraints.

b. Work that is within FMA capability but in excess of local FMA capacity may be assigned to the private sector industrial base or to an appropriate depot activity.

c. To increase operational availability, FMAVs may be assigned concurrent with CNO-scheduled depot availabilities. In these instances, a formal agreement between the FMA and the cognizant Naval Shipyard, or Supervisor of Shipbuilding, specifying responsibilities, should be obtained.

d. Intermediate-level maintenance is to be executed on a continuous basis, as well as during dedicated FMAVs.

e. Authorized work includes, but is not limited to the following:

- (1) Preventive maintenance.
- (2) Corrective maintenance.
- (3) Tests and inspections.
- (4) Provision of services such as electrical power, water, gas and air replenishment, and tool issue.
- (5) Installation of alterations.
- (6) Work on electronic miniature/microminiature printed circuit boards, components, modules, subassemblies, and other equipment coded for intermediate-level repair.
- (7) Calibration and repair services for electrical and electronic test and monitoring equipment; pressure, vacuum, and temperature measuring devices; and mechanical measuring instruments.
- (8) Technical assistance to ship's force in diagnosing system or equipment problems and assistance in repairs, as necessary.
- (9) Assistance in the emergency repair and manufacture of unavailable replacement parts or assemblies.

f. Work on equipment held in storage as rotational assets

(e.g., missiles, torpedoes) shall be accountable to the item's Life Cycle Manager and not to the activity storing or testing the equipment.

g. FMAs shall use either the Logistic Data System (LDS) or the Maintenance Resource Management System (MRMS) for identification, assignment, and tracking of work items, schedules, and resources. (Note: The Navy Enterprise Maintenance Automated Information System (NEMAIS) will replace these systems as it is introduced in the various regions.)

h. FMAs may perform work on foreign ships if authorized by CNO (N43) in accordance with paragraph 4bb of the basic instruction and references (e) and (cc). Foreign ship repair work that would either interfere with future planned work or would restrict an afloat FMA from meeting its readiness requirement for getting underway shall not be undertaken.

#### 4. Responsibilities

##### a. Chief of Naval Operations (CNO).

(1) CNO (N43) will establish general policy and guidance concerning accomplishment of intermediate-level maintenance.

(2) CNO Ships' Resource Sponsors (N42, N75, N76, N77, and N78) will establish the number of afloat and ashore FMAs required in support of fleet needs.

##### b. FLTCs. FLTCs shall:

(1) Plan and schedule FMAVs.

(2) Determine FMA manpower and funding requirements for the preparation of budgets.

(3) Manage resources allocated for intermediate-level maintenance.

##### c. Commander, Naval Sea Systems Command (COMNAVSEASYS COM). COMNAVSEASYS COM shall:

(1) Provide technical support to FMAs.

(2) With FLTC assistance, define and maintain FMA baseline capability descriptions. As a minimum, the baseline will describe, by FMA type: work center functions, billets,



industrial plant equipment, and maintenance responsibilities.

d. Commander, Naval Reserve Force (COMNAVRESFOR).  
COMNAVRESFOR shall coordinate efforts with the FLTCs to optimize the productivity and contribution of the Selected Reserve to the fleet's maintenance requirements.

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DEPOT-LEVEL MAINTENANCE

1. Definition. Depot-level maintenance is that maintenance which requires skills or facilities beyond the level of the organizational and intermediate levels and is performed by naval shipyards, private shipyards, naval ship repair facilities, or item depot activities. Approved alterations and modifications which update and improve the ship's military and technical capabilities are also accomplished. Depot availabilities are defined in reference (c).

2. Policy

a. Every ship completing a CNO-scheduled depot availability shall be capable of carrying out its mission with a reasonable expectation of maintaining a satisfactory condition of readiness until the next CNO-scheduled depot availability.

b. All depot availabilities shall be accomplished at the lowest practical cost, and work performed shall adhere to published maintenance and repair technical requirements and standards.

c. Maintenance and repair work essential for safe and reliable nuclear propulsion plant operations and submarine submerged operations will not be deferred from one depot-level maintenance period to the next.

d. CNO-scheduled depot availabilities shall be scheduled in accordance with reference (c) guidelines.

e. Maximum adherence to the reference (c) notional schedule is essential to minimize degradation of a ship's material condition and to ensure orderly workload planning at depot-level maintenance activities. In the event it becomes necessary to revise planned availability schedules, the procedures outlined in subparagraph 3c shall be followed.

f. Commencement of Maintenance Cycle. Maintenance cycles shall commence on the first day of the month after completion of Post Shakedown Availability (PSA), or as indicated in the Class Maintenance Plan (CMP), or as indicated in reference (c) for that ship class.

g. Priority of Work in Naval Shipyards (NSYs). Work shall be accomplished in NSYs in accordance with the following priorities, listed in descending order:

- (1) Work associated with the Trident program.

- (2) Voyage repairs (VR).
- (3) Work on ships being prepared for deployment.
- (4) CNO-scheduled depot maintenance availabilities.
- (5) Restricted/Technical availabilities (RAV/TAV).
- (6) Other U.S. Navy ship availabilities, except for inactivation or disposal.
- (7) Refurbishment of repairables.
- (8) Work on other U.S. Government ships.
- (9) Inactivation and disposal availabilities.
- (10) Work on foreign ships.

h. Reactor plant maintenance, repair, and modernization in nuclear-powered warships, beyond the capability or capacity of the organizational level, shall be assigned only to nuclear-capable shipyards or nuclear-capable intermediate maintenance activities and performed following the requirements established by the Director of Naval Nuclear Propulsion Program (CNO (N00N), COMNAVSEASYS COM (SEA 08)).

i. Depot-level repair, maintenance, and modernization for steam plant systems, electric plant systems, and those auxiliary ship systems which support reactor plant and associated reactor safety systems in nuclear powered warships shall be assigned only to nuclear capable shipyards and performed per the requirements established by COMNAVSEASYS COM.

j. Availabilities of tenders with nuclear support facilities may be assigned to non-nuclear capable shipyards, provided the requirements of reference (gg) are met.

k. Availabilities awarded in the private sector shall be accomplished in such a manner to ensure quality performance, promote vigorous and healthy competition, support the nation's industrial base, and include quality of life considerations for ship's force.

l. Since condition-directed repair renders full definition of all work prior to the start of the availability impractical, availability contracts must have the flexibility to add and delete work, during availability execution, without placing the government at a negotiating disadvantage.

### 3. Procedures

#### a. Availability assignment and scheduling.

(1) CNO (N43) will:

(a) Coordinate among OPNAV staff, Fleet, COMNAVSEASYSCOM, and Program Executive Offices (PEOs) or Direct Reporting Program Managers (DRPMs), as required, the assignment and scheduling of all CNO-scheduled depot availabilities.

(b) Maintain the approved CNO Depot Maintenance Schedule (OPNAVREPORT 4710), as a file, in the Fleet Modernization Program Management Information System (FMPMIS) database.

(2) The CNO Operational Forces Resource Sponsors (N42, N75, N76, N77, and N78) will determine the fiscal year that activation and inactivation availabilities are to be scheduled.

(3) The FLTC, or designated representative, shall:

(a) Assign and schedule RAVs, TAVs, and VR availabilities.

(b) Recommend changes to, or approve as authorized in subparagraph 3c, changes to CNO-scheduled depot availabilities.

(4) PEOs, DRPMs, and Ship Program Managers (SPMs) shall recommend changes to, or approve as authorized in subparagraph 3c, changes to CNO-scheduled depot availabilities.

b. CNO-scheduled depot maintenance availabilities. Ships shall generally undergo CNO-scheduled depot maintenance availabilities at the intervals and durations set forth in reference (c).

#### (1) Maintenance Cycle

(a) Allowable deviations from submarine maintenance cycles are specified in reference (jj).

(b) Allowable deviations from surface ship maintenance cycles are specified in reference (c).

(c) For deviations that exceed references (c) or (jj) guidelines, fleet shall provide COMNAVSEASYSCOM an assessment of the ship's material condition. COMNAVSEASYSCOM shall provide fleet impact of proposed deviations. Reasons for these

deviations along with any impact identified shall be included on the fleet's schedule change request.

(2) Durations. Reference (c) availability durations are to be used as nominal durations in long range planning. After the scope of the work package is defined at the Work Definition Conference (WDC), it is incumbent upon the accomplishing activity to evaluate the work package and assess its capacity and capability to perform the work in the allotted time. Recommended adjustments to availability durations should be officially addressed during WDC, or as soon as possible thereafter.

c. Schedule changes. Changes to CNO-scheduled availabilities may become necessary for operational or other reasons. However, such changes must be held to an absolute minimum in order to maintain to the maximum extent practical the Ship Maintenance and Modernization Program integrity. Maintaining schedules will avoid workload disruption, minimize associated additional costs, and increase operational availability. In the event it becomes necessary to revise the schedules, the following procedures shall be followed:

(1) FLTCs are authorized to approve changes to overhaul availabilities, Selected Restricted Availabilities (SRAs), Docking SRAs (DSRAs), Planned Maintenance Availabilities (PMAs), Docking DPMs (DPMAs), and Depot Modernization Periods (DMPs) provided they:

(a) Do not change accomplishing activity or fiscal year of execution.

(b) Do not constitute a major workload adjustment.

(c) Do not extend the availability duration by greater than 35 days from the currently approved duration.

(d) Do not deviate from the maintenance cycle beyond the allowable deviations specified in references (c) and (jj).

(e) Are coordinated with COMNAVSEASYS COM, the PEO or DRPM, and the accomplishing activity, and reported to CNO (N43) and the cognizant Operational Forces Resource Sponsor.

(2) TYCOMs, or other designated subordinate activities, may be authorized by the FLTC, in writing, to approve changes authorized in subparagraph 3c(1) provided the changes also:

(a) Do not alter the availability start date by greater than 35 days.

(b) Do not alter the completion date by greater than 35 days beyond the CNO-completion date established at the commencement of the availability.

(c) Are reported to the FLTC.

(3) PEOs, DRPMs, and SPMs are authorized to approve changes to FOAs, PSAs, activation, or inactivation availabilities provided they:

(a) Do not change accomplishing activity or fiscal year of execution.

(b) Do not constitute a major workload adjustment.

(c) Are coordinated with Fleet, COMNAVSEASYSCOM, and the accomplishing activity, and reported to CNO (N43) and the cognizant Operational Forces Resource Sponsor.

(4) Changes not authorized in subparagraphs 3c(1) through 3c(3) shall be referred to CNO (N43) for approval.

(5) Issuance of changes to the CNO Depot Maintenance Schedule, and recommendations for changes, normally are accomplished by naval message. The FMPMIS OPNAVREPORT 4710 database will be kept updated to reflect all approved schedule changes and is the official Department of Navy (DON) ship depot maintenance scheduling database.

(6) FLTC, COMNAVSEASYSCOM, PEO, or DRPM schedule changes and change requests shall be addressed to: CNO (N43), the cognizant CNO Operational Forces Resource Sponsor (N42, N75, N76, N77, or N78), and CNO (N00N) for nuclear-powered ships and tenders with nuclear support facilities, with an information copy to: the cognizant COMNAVSEASYSCOM codes; PEO, DRPM, or SPM; planning yard; SUPSHIP or NSY; and other interested activities.

(7) Activities executing availabilities which will extend beyond the current CNO-approved completion date must formally propose a new completion date in sufficient time to obtain approval of the request prior to the expiration of the currently CNO-approved completion date.

d. Solicitation of private sector availabilities.  
Private sector availabilities will be solicited, competed, and awarded using the Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS).

4. Responsibilities

a. CNO

(1) CNO Operational Forces Resource Sponsors (N42, N75, N76, N77, and N78) will:

(a) Approve Maintenance Program Master Plans for their respective platforms, including Naval Reserve Force (NRF) ships listed in reference (c).

(b) Monitor Maintenance Program Master Plan compliance.

(c) Review all CNO-scheduled depot availability changes with CNO (N43) prior to approval.

(2) CNO (N43) will:

(a) Document, in reference (c), the notional depot availability durations, intervals, and repair man-days approved by the Operational Forces Resource Sponsors, for each ship class.

(b) Control schedules for CNO-scheduled availabilities in accordance with paragraph 3.

(c) Coordinate all depot maintenance schedule changes with: the cognizant Operational Forces Resource Sponsors, COMNAVSEASYS COM, the cognizant PEOs or DRPMs, and for nuclear-powered ships or ships with nuclear support facilities, the Director of Naval Nuclear Propulsion Program (CNO (N00N)).

b. FLTCs. FLTCs shall:

(1) Maintain the depot maintenance intervals and cycles, issued in reference (c), to the maximum extent practical within operational requirements.

(2) Plan for and monitor availability execution to achieve a balance of cost and schedule for the scope of work authorized. Ensure that any growth in the scope of work authorized is necessary to reasonably assure safe, reliable operation of the ship during the subsequent operating cycle.

(3) Inform the Deputy Chief of Naval Personnel (PERS-4) of any significant changes, which would affect ship manning requirements during an extended depot availability.

(4) Ensure that testing of all systems and equipment installed or repaired during the availability, which require at-



sea testing, is conducted prior to availability completion.

(5) Coordinate with the PEO, DRPM, or SPM, as applicable, in the accomplishment of depot availability planning.

(6) Implement docking officer qualification and certification requirements as issued in COMNAVSEASYS COM instructions.

(7) Plan for and provide berthing, messing, offices, classrooms, equipment stowage space, and ship's force repair shop space in accordance with reference (bb), when shipboard facilities are expected to become unusable or uninhabitable. This pertains to all private shipyard availabilities and all public shipyard availabilities when the public shipyard is unable to provide adequate facilities.

(8) Assign and schedule RAV, TAV, and VR availabilities. This may be delegated to subordinate commands for accomplishment.

(9) Ensure completion data for SRF availabilities is forwarded to COMNAVSEASYS COM for analysis and refinement of maintenance requirements.

(10) Approve changes to CNO-scheduled availabilities authorized in paragraph 3.

c. COMNAVSEASYS COM. COMNAVSEASYS COM shall:

(1) Establish NSY operating policies.

(2) Furnish timely information on the prospective workloads of NSYs and SUPSHIPS to the respective FLTCs for their guidance, recommending changes to scheduled availabilities to balance workload and avoid excessive cost to Navy.

(3) Establish performance standards for the accomplishment of maintenance, modernization, and all other shipwork scheduled for accomplishment by depot-level maintenance activities.

(4) Ensure that NSYs and SUPSHIPS execute ship repair and modernization within the scope of work authorized, employing prescribed technical methods, specifications, and quality assurance requirements in the most cost efficient manner.

(5) Coordinate the development of methods and products for depot-level maintenance planning and execution which make use of advanced digital information systems and technology, such as

Technical Information Files (TIFs) currently being developed under the Advanced Industrial Management (AIM) Program.

(6) Establish minimum requirements for qualification and certification of docking officers for floating drydocks, graving docks, and marine railways.

(7) Ensure that management information systems used for the collection and analysis of post-availability completion and as-found condition data are compatible with the 3-M system.

(8) Conduct system and equipment engineering analysis to eliminate or refine maintenance periodicities.

(9) Assist PEOs or DRPMs and FLTCs or TYCOMs in coordinating private-sector, CNO-scheduled, depot availability assignment and contracting within established FAR and DFARS guidelines.

(10) Assist FLTCs in the design, acquisition, and technical support of SRFs.

d. PEOs, DRPMs, and SPMs. PEOs, DRPMs, and SPMs shall:

(1) Issue availability planning milestones that maximize the probability of successful execution, and:

(a) If the availability is solicited for accomplishment in a coast wide area, support a contract award no less than 120 days before the CNO-scheduled availability start date.

(b) If the availability is solicited for accomplishment in an extended solicitation area, support a contract award no less than 60 days before the CNO-scheduled availability start date.

(c) If the availability is to be conducted within a ship's homeport area, support a contract award no less than 30 days before the CNO-scheduled availability start date.

(d) If unable to comply with (a) through (c), above, alternative contract options must be formally reviewed with the fleet, and forwarded to CNO (N43) for resolution, if required.

(2) If availabilities detailed in subparagraph 4d(1)(a), do not support contract award 90 days or greater than the CNO-scheduled availability start date, notify CNO (N43).

(3) Conduct a post-overhaul evaluation and review with

the Fleet or TYCOM within 60 days of an overhaul availability completion.

(4) Analyze post-availability completion data, and refine maintenance requirements data for FLTC and CNO (N42, N75, N76, N77, N78, and N43) use.

(5) Ensure system and equipment engineering analysis is conducted to eliminate or refine maintenance periodicities.

(6) Coordinate with the FLTCs or TYCOMs all private-sector, CNO-scheduled, depot availability assignment and contracting within established FAR and DFARS guidelines.

(7) Conduct a combined alteration and repair verification conference with the fleet at least 8 months prior to an overhaul availability start.

(8) Approve changes to CNO-scheduled availabilities authorized in paragraph 3.

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MAINTENANCE PROGRAMS

1. Maintenance Program Definition

a. The goal of Navy Ship Maintenance is to maintain the appropriate ship material condition and availability for operations (readiness). The Maintenance Program established for a class of ships is the structure for defining and using RCM-based applicable and effective maintenance elements in a predetermined manner to maintain or restore ship material condition at the level needed to achieve the required degree of readiness. These elements include personnel, material, facilities (public and private), programs, and procedures. The overall goal is successful determination of maintenance requirements and authorization of applicable and effective maintenance actions in a near continuous flow of maintenance candidates to the most appropriate level and maintenance activity for accomplishment. Timed to best support operations, screening, planning and executing maintenance migrates from a centralized timed based batch process to a decentralized condition-based, nearly continuous process. Maintenance will be performed at the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost.

b. The Navy ship is a unique entity in that responsibility for both the operation and maintenance of the ship rests with the ship itself. Other Navy organizations exist to support that entity.

c. By focusing on engineering requirements instead of administrative nuances, differences among the four maintenance programs - Engineered Operating Cycle, Progressive, Phased Maintenance, and the Aircraft Carrier Continuous Maintenance Programs - currently defined for ship maintenance are being minimized as the Navy transitions to Condition-Based Maintenance (CBM) and continuous maintenance. The fundamental CNO-approved approach places the emphasis on ensuring a ship's commanding officer is provided the information and support needed to ensure a reasonable probability that the ship is ready for prompt and sustained combat operations at sea on a continuing basis, i.e., appropriate material condition. The basis for this information is principally the Maintenance and Material Management (3-M) system, which provides Maintenance Requirements Cards (MRCs) for organizational-level preventive maintenance actions, and the

Maintenance Resource Management System (MRMS), which provides intermediate- and depot-level preventive maintenance actions via Master Job Catalog (MJC) items. MRCs and MJC items are developed by cognizant technical authority. MJC items shall provide fully detailed procedures for accomplishment of intermediate-level maintenance actions, but may reference other task-standard documents for the accomplishment of depot-level maintenance actions. Performance of these organizational-level MRCs and intermediate- and depot-level MJC items provides:

(1) Assurance that systems are operating within technical specifications.

(2) Assurance that proper maintenance actions (e.g., lubrication, greasing, and adjustments) are performed.

(3) Technical information that indicates system condition and can be used as the basis for determining required corrective maintenance.

(4) Technical information to be used by the technical community as the basis for determining process or technical changes.

(5) Technical information to be used as the basis for sustaining material certification.

d. Maintenance actions that are used to obtain objective evidence of equipment performance or condition trends are considered preventive maintenance.

## 2. Policy

a. Each ship class, including unique, single-ship classes, shall have a CNO-approved Maintenance Program.

(1) Preventive maintenance actions identified in a Maintenance Program for a ship class shall be developed using approved RCM techniques in accordance with reference (1). MRCs, for organizational-level preventive maintenance, and MJC items for intermediate- and depot-level preventive maintenance, shall be the reference documents for accomplishing these actions.

(2) Corrective maintenance determination shall be based on Condition-Based Maintenance (CBM) requirements, i.e., on objective evidence of need.

(a) Condition-directed repairs should be based on current evidence of degradation below system performance requirements. Insurance repairs should be based on material condition trend predictions of future degradation below system performance requirements.

(b) Where CBM diagnostics, inspections, or tests are unavailable or impractical to determine actual equipment condition or trends, time-directed repairs shall be based on engineering analysis such as assessment of the as-found material condition of components or systems when they are disassembled for maintenance or age-reliability analysis, including age-exploration.

(3) Maintenance actions shall be authorized to be performed by the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost.

(4) Effective use of specialized husbandry agents for maintenance determination, authorization, and management is encouraged where such use provides a clear value added.

(a) Husbandry agents shall meet qualifications established for performing specific functions of the maintenance program. For example, port engineers are expected to be highly qualified, licensed marine engineers with both an engineering degree and prior sailing and Port Engineer experience, or equivalent U.S. Navy ship repair experience.

(b) Husbandry agents normally shall be assigned responsibility for no more than two ships and shall be involved in the determination, planning, authorization, and execution of all intermediate- and depot-level maintenance actions.

(c) When performing duties in the areas of work determination, authorization, and execution, husbandry agents are responsible to the fleet.

b. The process for developing the maintenance program for new ship classes shall:

(1) Follow procedures specified in paragraph 4g of the basic instruction and reference (1).

(2) Apply both technical and cost criteria to maintenance

decisions, providing due consideration to ship design and crew composition.

(3) Accommodate differences in intermediate- and depot-level industrial capability and capacity.

(4) Take into account the policy that maintenance will be performed at the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost.

(5) Ensure that pre-depot-availability tests and inspections, required for maximum work identification, are developed. MRCs and MJC items shall be the reference documents for accomplishing these tests and inspections.

c. Maintenance programs for in-service ship classes should be reviewed for conformance with the guidelines of subparagraph 2b, and modified in areas where it can be determined that the expected results would be cost effective.

d. A CNO-approved, tailored maintenance program shall be developed for each ship class. The Maintenance Program Master Plan shall describe the basic parameters of the maintenance program for that ship class. This includes:

(1) Establishing minimum organizational-level repair capabilities needed to satisfy operational requirements self-sufficiency objectives.

(2) Establishing the intermediate- and depot-level requirements (e.g., number, type, duration, interval between, and man-day size of availabilities).

(3) Identifying the maintenance approach used for critical systems and equipment.

(4) Identifying all required support features, including facilities requirements, specific turnaround programs, insurance material programs, special diagnostic systems, and husbandry agent (e.g., Port Engineers or AEGIS Homeport Engineering Teams) qualification and maintenance management requirements.

(5) Developing a plan of action and milestones for implementing, and improving, maintenance support requirements.



e. A COMNAVSEASYSCOM-approved Class Maintenance Plan (CMP) shall be developed for each ship class in conformance with reference (kk). The CMP is the principal document for executing the tailored maintenance program for a ship class. The CMP for a ship class shall describe all preventive maintenance actions and maintenance support requirements. This includes:

(1) Identifying all organizational-, intermediate-, and depot-level maintenance actions, engineered periodicities, and the maintenance echelon expected to accomplish each.

(2) Identifying those maintenance actions designated by the cognizant technical authority as mandatory or that RCM analysis has shown to be valid time-directed maintenance. Time-directed maintenance that is not condition-based should be minimized.

(3) Identifying those maintenance actions associated with assessing equipment condition, including pre-availability diagnostics, tests, and inspections performed by ship's force or by other maintenance support organizations.

(4) Providing details regarding the level of effort or involvement of each maintenance support organization and program designated in the Maintenance Program Master Plan.

f. MRCs and MJC items may be incorporated or referenced in the CMP for each ship class.

g. MRC and MJC item periodicities shall be modified based on the results of RCM experience. These periodicities are to be used as a scheduling tool for accomplishment of the maintenance action.

h. MRC and MJC item actions shall include diagnostics, tests, inspections, and selected acceptance criteria to determine the need for condition-directed maintenance.

i. The CMP is the core of the logistics program developed for each ship class. The translation of these plans into maintenance actions require the development and maintenance of MRCs and MJC items for the assessment of equipment condition, determination of maintenance requirements, and execution of maintenance actions.

j. A thorough knowledge and assessment of actual equipment condition in relation to its minimally acceptable condition is

the basis for maintenance decisions. Equipment condition is a broad term that of necessity includes static parameters, such as size, shape, and the extent of material degradation observed from prior maintenance on similar or the same components, and dynamic parameters, such as speed, temperature, pressure, and electrical characteristics. Ship's force is required to know the condition of its ship and equipment.

k. The complexities of shipboard systems and equipment have necessarily led to the development of other supporting organizations, programs, requirements documentation, and information systems to augment the original MRC and MJC item process. These support organizations, programs, requirements documentation, and information systems should be: continually reviewed for effectiveness; integrated, consolidated, or standardized, as practicable; and modified, as appropriate, to maximize fleet self-sufficiency. Examples are:

(1) Support organizations:

- Submarine Maintenance Engineering, Planning, and Procurement (SUBMEPP)
- In-Service Engineering Agent (ISEA)
- Fleet maintenance Activities
- Ship Availability Planning and Engineering Center (SHAPEC)
- Fleet Technical Support Centers (FTSCs)
- Regional Maintenance Teams (RMTs)
- Regional Repair Centers (RTCs)
- Maintenance Managers (including Port Engineers, Ship Superintendents, Ship's Coordinator and Maintenance Planning Managers)

(2) Support programs:

- Integrated Logistic Overhaul (ILO)
- Integrated Logistic Review (ILR)
- Advanced Industrial Management (AIM) Program
- Surface Ship Maintenance Effectiveness Review (SURFMER) Program
- Reliability-Centered Maintenance (RCM) Certification Program

(3) Supplementary requirements documentation:

- Naval Ships' Technical Manuals (NSTMs)

- System, subsystem, and equipment technical manuals
- Technical specifications and standards
- Joint Fleet Maintenance Manual (JFFM)

(4) Supplementary information systems:

- Ship Configuration Logistics Support Information System (SCLSIS)
- Navy Advance Technical Information System (ATIS)
- Maintenance Resource Management System (MRMS)
- Maintenance Requirement System (MRS)

1. Depot- and intermediate-level repair work determination shall be based on:

(1) Current Ship Maintenance Project (CSMP) records of deferred and completed maintenance.

(2) Objective evidence of degradation or failure determined by results of MRCs or MJC items conducted by ship's force or support programs.

(3) Material condition trend predictions of future failure.

(4) Time-directed maintenance, which is based on age-reliability analysis, appropriate distribution of failures, and availability of an applicable maintenance action.

m. Depot-level availability repair work authorization shall be based on assessment of the relative risk of non-accomplishment to personnel safety and ship mission readiness. Authorization of repair work items shall be prioritized in descending order of risk to personnel safety and mission readiness. Relative risk is the product of the probability of failure before the next scheduled availability and a measure of the severity of failure.

n. Reactor plant maintenance, repair, and modernization in nuclear-powered warships shall be programmed in accordance with requirements and policies established by the Director of Naval Nuclear Propulsion Program (CNO (N00N)), COMNAVSEASYS COM (SEA 08).

o. Maintenance and repair work essential for safe and reliable nuclear propulsion plant operations and submarine submerged operations shall not be deferred from one depot-level

maintenance period to the next.

### 3. Repair Procedures and Support

a. Repair Determination. FLTCs, acting through their TYCOMs, or other designated subordinates, shall determine the repair actions required to maintain or restore equipment to its intended condition based on technical requirements defined by the cognizant technical authority. This determination shall use RCM principles. Repair determination assistance is available through various programs, organizations, and information systems within the Fleet and SYSCOMs. Examples are:

(1) Repair determination programs:

- Material Condition Assessment Program (MCAP)
- Test and Monitoring Systems (TAMS)
- Shipboard Instrumentation and Systems Calibration (SISCAL)
- Pre-availability tests and assessments
- Work Definition Inspections (WDIs)
- Fleet Inspections
- Machinery History and Trend Analysis
- Assessment of Equipment Condition (AEC) and Hull Mechanical and Electrical Readiness Assessment (HM&E RA) Programs
- Periodic Maintenance Requirements Program

(2) Repair determination organizations:

- Board of Inspection and Survey (INSURV)
- Submarine Monitoring, Maintenance and Support Program Office (SMMSO)
- Submarine Maintenance Engineering, Planning, and Procurement (SUBMEPP)
- Performance Monitoring Teams (Surface and Submarine)

(3) Information systems:

- Current Ship Maintenance Project (CSMP)
- Planned Maintenance System Scheduler (PMS SKED)

b. Repair Authorization. FLTCs, acting through their TYCOMs or other designated subordinates, shall authorize required maintenance actions based on safety considerations and on cost,

schedule, and mission trade-offs, as required. The choice of required maintenance actions to be authorized shall be based on evaluation of risk to personnel safety and ship mission readiness imposed as a result of those maintenance requirements deferred. Acceptance of risk is unavoidable; proper management of risk is essential.

c. Repair Execution. Repairs shall be executed, in accordance with technical requirements, and in keeping with the policy that maintenance will be performed at the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total cost. If funding constraints exist, priority must be placed on providing ships that can safely and reliably perform their missions.

d. Reactor plant maintenance, repair, and modernization shall be performed in accordance with requirements established by COMNAVSEASYS COM (SEA 08).

#### 4. Responsibilities

a. CNO. The CNO Operational Forces Resource Sponsors (N42, N75, N76, N77, and N78) will:

(1) Approve all tailored maintenance program (s), and any modifications to these plans, for their respective platforms.

(2) Plan and program the resources required to fully support their tailored maintenance program (s), including resources for organizational-, intermediate-, and depot-level maintenance.

(3) Monitor tailored maintenance program (s) compliance.

b. FLTCs. The FLTCs shall:

(1) Participate with PEOs, DRPMs, and SPMs in the development of the Maintenance Program for each ship class.

(2) Execute each program in strict accordance with this instruction and specific guidance provided in the ships' CMP.

(3) Manage risks inherent in making maintenance decisions. Prudent risk is acceptable; no maintenance decision is risk free.

(4) Assist the PEO, DRPM, or SPM in determining husbandry agent qualifications and maintenance management requirements.

c. COMNAVSEASYSCOM. COMNAVSEASYS COM shall:

(1) Develop, issue, and maintain organizational-level MRCs and intermediate- and depot-level MJC items.

(2) Assist PEOs and DRPMs in developing tailored maintenance program (s) and CMPs.

(3) Review and approve CMPs, including those developed by PEOs and DRPMs, ensuring that they satisfy the requirements of this instruction, are technically correct, and are best suited to individual ship classes.

(4) Recommend changes to existing maintenance programs and CMPs that: support Navy's continued drive toward integration, standardization, and fleet self-sufficiency; are based on RCM experience; and are cost effective.

(5) Ensure effective support of maintenance determination, planning, and execution by field activities, and continuously improve maintenance procedures and technology.

d. PEOs, DRPMs, and SPMs. PEOs, DRPMs, and SPMs shall:

(1) Develop a tailored maintenance program (s), for CNO approval, that is best suited to an individual ship class, that supports fleet mission and material readiness needs, and is cost effective.

(2) Develop, for COMNAVSEASYS COM approvals, issue, and maintain CMPs based on approved tailored maintenance program (s) and the requirements of this instruction. The CMP shall be issued by delivery of the first ship of the class.

(3) Ensure adequate logistics support for their Maintenance Programs.

e. Director of Naval Nuclear Propulsion Program (CNO (N00N), COMNAVSEASYS COM (SEA 08)). SEA 08 is responsible for establishing nuclear-powered warship reactor plant maintenance, repair, and modernization requirements and policies.

MINIATURE/MICROMINIATURE (2M) MODULE TEST & REPAIR (MTR)

1. Definition

a. Miniature Electronic Repair. Miniature electronic repair is defined as the repair of single-sided and double-sided Circuit Card Assemblies (CCA) and Electronic Modules (EM). It includes the removal and installation of discrete and multileaded components, removal and application of conformal coatings, wiring and soldering of various terminals or connectors, and replacement of damaged conductors and board laminate. Some Miniature repairs require the use of a stereomicroscope. Miniature repair also covers electrostatic discharge (ESD) familiarization and handling procedures to minimize ESD risk to CCA/EMs.

b. Microminiature Electronic Repair. Microminiature electronic repair is a more technically demanding level of repair than Miniature and requires additional training and specialized tools, materials and repair equipment. It includes repair of CCA/EMs with high-density component packaging, multilayer conductor and laminate, edge lighted panel, welded lead and surface mount technology repair. Microminiature electronic repair includes repairs to modules and small "daughter" boards which are too complex or dense for miniature electronic repair, repairs to flexible printed circuit boards and printed circuit cables; removal and installation of special connectors, eyelets, and terminals; electroplating, micro-soldering, repairs to ceramic and composite CCA/EMs and complete rebuilding of damaged electronic circuitry.

2. Limitations. The 2M MTR Program excludes internal repairs to micro-electronic components, but their removal or replacement is acceptable. Other exclusions include internal repairs to critically sensitive components, such as miniature radio frequency balanced mixers, or repairs that may require special alignment, special disassembly/assembly, calibration and test equipment and other repair tools, materials and equipment not available to the maintenance activity. Shipboard and selected shore activities 2M repairs are to be performed by certified technicians in accordance with policy and procedures in reference (n).

3. Discussion

a. Navy shipboard and shore-based systems with removable, high cost CCA/EMs are characterized by increased packaging

complexity, multi-layer construction, and the extensive use of microminiature devices and subminiature components. The increased use of such sophisticated CCA/EMs in Navy systems and equipments and the limited amount of shipboard spare CCA/EMs and Maintenance Assist Modules calls for expanded Fleet electronic repair and diagnostics capabilities at all maintenance levels. These capabilities must include properly trained and certified personnel, effective and affordable 2M repair equipment and test equipment, selected diagnostics and repair procedures and CCA/EM repair parts.

b. The 2M MTR Program provides the 2M repair equipment and associated accessories, tools, materials, MTR test equipment and ILS including Navy Training Plans, curriculum material and training aids for the 2M MTR courses. The program also provides a Navy 2M MTR Certification Plan, a Standard 2M Maintenance Practices Manual and test and repair procedures for the repair of specific CCA/EMs. The program also develops and maintains piece part allowances for ship classes, Fleet Maintenance Activities ashore, and other designated shore activities that support the fleet.

c. Module Test and Repair (MTR) Test Equipment. The MTR test equipment supplements the 2M Electronics Repair capabilities and provides the Fleet and authorized shore activities with portable, cost effective manually operated test equipment, semi-automatic controller aided test systems (AN/USM-646, AN/USM-674, AN/USM-676), associated operating software, MTR test procedures (i.e. Gold Disks and Pinpoint test routines), test accessories and MTR Test Equipment ILS. The program also develops MTR Test Procedure Candidate Lists periodically from NAVSUPSYSCOM and Defense Logistics Agency CCA/EM requisition data in order to facilitate the selection and development of MTR test procedures that will provide the most return on investment and have the highest probability to improve system/equipment readiness.

4. Policy. There are two principal categories of 2M repair: normal repair, and emergency repair. All 2M repair actions, regardless of category, must be performed by certified technicians utilizing certified facilities. The Source, Maintenance, and Recoverability (SM&R) code identifies the maintenance levels that may remove, repair, replace, or condemn a CCA/EM. 2M MTR-certified technicians will screen and attempt to repair all CCA/EMs within their training and capability, regardless of the SM&R code. This includes depot level repairable and consumable CCA/EMs.

a. Normal repair. Normal repair is the application of a



progressive repair concept consisting of sequential attempts to repair an item following the established organizational-, intermediate-, and depot-level repair hierarchy. If a ship has certified 2M MTR technicians and facilities, organizational-level test or repair is normally attempted prior to obtaining a replacement item from the supply system. If ship's force is unable to repair the item, when feasible, it is shipped to an Fleet Maintenance Activity (FMA) for further inspection. If the repair is within the capability of the FMAs 2M-MTR trained personnel and facility, the IMA will verify the condition of the CCA/EM and conduct intermediate-level repairs, if possible. If the FMA is unable to repair the item, and it is designated as a Depot Level Repairable (DLR), it is shipped to the depot facility for further inspection and repairs.

b. Emergency repair. Emergency repair is a repair deemed to normally be beyond a commands authorized 2M repair capability, that has been authorized by a ships' or shore activities' commanding officer because of operational necessity. Even if this repair is considered adequate, the item will be designated for higher-level repair and shipped to the appropriate repair activity when operations permit. The FMA or other appropriate repair activity will complete actions as indicated in subparagraph 4a.

c. The condition of a CCA/EM or other system and equipment lowest replaceable unit with electronic circuitry must be verified at a 2M MTR station before discard. Ships should send items that are coded for organizational-level discard (consumables) to an FMA for possible repair when feasible.

d. Technicians who repair CCA/EMs and subassemblies must receive formal training and certification in miniature or microminiature repair.

e. Ships, FMAs, and other designated shore activities performing miniature and microminiature electronic repair must meet the technical criteria established by Commander, Naval Sea Systems Command (COMNAVSEASYS COM).

## 5. Responsibilities

a. Chief of Naval Operations (CNO). CNO (N43) is the program and resource sponsor for the 2M MTR Program. As such, N43 is responsible for properly funding the program and providing policy and guidance, as required.

b. Fleet Commanders (FLTCs). FLTCs shall:

(1) In accordance with 2M MTR policy and responsibilities in reference (n), the Joint Fleet Maintenance Manual (CINCLANTFLT/CINCPACFLT INST 4790.3; Volume IV, Part I, Chapter 11) operationally administer and promote optimum use of the 2M MTR Program at the organizational and intermediate levels and ensure that 2M repairs are conducted at the lowest feasible maintenance level.

(2) Assist the 2M and MTR In-Service Engineering Agents (ISEAs) in initial Fleet evaluations of new 2M MTR equipment and associated software. Identify outfitting requirements and priorities and assist 2M MTR ISEAs in the delivery of 2M MTR equipment to authorized 2M MTR facilities. Assist 2M MTR ISEAs obtain reusable 2M MTR equipment and 2M repair piece parts from decommissioned ships and disestablished shore commands.

(3) Inspect and certify 2M repair facilities and technicians in accordance with established COMNAVSEASYS COM certification procedures.

(4) Ensure that 2M repair and MTR test equipment training is scheduled and provided to personnel as required to continuously maintain 2M MTR station certification requirements and minimize gaps in 2M MTR capability and capacity caused by technicians sea shore rotation, end of enlistment or other change of duty assignments.

(5) Designate ships and shore activities as Gold Disk developer commands. Assist the MTR test equipment ISEA in the selection of high priority Gold Disk test procedure candidates. Assist the MTR test equipment ISEA to obtain access to CCA/EMs for test procedure development when CCA/EM assets are not available from other sources.

(6) Ensure that all 2M MTR maintenance actions are documented in the Module Test and Repair Tracking System (MTRTS) and aggregate reports provided each quarter in accordance with direction in the Joint Fleet Maintenance Manual.

c. COMNAVSEASYS COM. COMNAVSEASYS COM shall provide technical direction and implement the 2M MTR Program. COMNAVSEASYS COM shall also:

(1) Provide overall 2M MTR Program management and establish procedures for orderly program direction.

(2) Provide nominations for the monthly CNO Gold Disk Developers Award and the associated letter of commendation and coordinate the associated military cash award for each awardee.

(3) Acquire and in conjunction with the Fleet, conduct initial evaluations and deploy 2M MTR equipment and integrated logistics support, including semi-automatic and manual test equipment to support CCA/EM test/diagnostics and repair.

(4) Coordinate the selection, development, and distribution of CCA/EM test and repair procedures.

(5) Establish standard 2M repair practices, 2M MTR personnel, and facility certification procedures to support repair of shipboard equipment that contains electronic circuitry.

(6) Develop, maintain, and acquire consolidated piece part allowances for each ship class and shore commands authorized 2M MTR capabilities.

d. PEOs, SPMs, and System and Equipment Acquisition Managers. PEOs, SPMs, and system and equipment acquisition managers shall comply with test and diagnostics policy in reference (11) and to the maximum extent feasible incorporate utilization of Organizational and Intermediate level 2M MTR capabilities into ILS planning and into system and ship Class Maintenance and Training Plans.

(1) Coordinate with the 2M MTR Program and determine the need to have test and repair analyses done by 2M MTR Program ISEAs on systems and equipment with CCA/EMs or other electronic circuitry. Ensure that Level of Repair Analyses done for new or modified systems, do not include costs to outfit and train existing O/I level 2M MTR facilities and personnel.

(2) When economically and technically feasible, fund for test/diagnostics and repair procedures that will utilize Fleet 2M MTR capabilities and coordinate with FLTCS and the 2M MTR Program manager to determine any required additional O/I level 2M MTR capabilities and capacity.

(3) Ensure that effective depot planning is conducted on new systems/equipment and that the progressive repair concept is applied to all CCA/EMs that can be supported with Fleet O/I level 2M MTR capabilities.

e. COMNETC. COMNETC, in coordination with COMNAVSEASYSKOM and the FLTCs, shall provide training facilities, curricula, and instructors for the 2M MTR Program.

f. COMNAVSUPSYSCOM. COMNAVSUPSYSCOM shall support the use of Fleet O/I level 2M MTR capabilities by ensuring that NAVSUP Instructions, guidance, procedures, and training are consistent

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with OPNAV and Fleet 2M MTR policy.

(1) Direct the distribution of stock for rotatable CCA/EM pools as requested by the FLTCs.

(2) Assist the 2M MTR program in selecting CCA/EMs candidates for test procedure development.

(3) COMNAVSUPSYSCOM shall assist the 2M MTR ISEAs in the development and revisions to 2M piece part Allowance Parts Lists (APLs) for ship classes and shore activities that are authorized 2M MTR capabilities.

## QUALITY MAINTENANCE

1. Background. Performing maintenance in accordance with published technical and quality assurance requirements is a long-standing policy. Quality assurance requirements carry equal weight with the technical requirements in the overall objective of quality maintenance. The technical complexity of present day ships reinforces the need for strict compliance with administrative and technical direction to ensure conformance to technical requirements during maintenance. Seemingly, trivial or minor deviations from requirements have resulted in the loss of life and degradation of ships' readiness.

## 2. Policy

a. Quality maintenance requires the proper execution of responsibilities by each individual involved in the planning, logistics support, and execution of the maintenance process. Workers and planners will be provided adequate tools, guidance, training, resources, and time to perform quality maintenance. Failure to consistently accomplish first time quality maintenance should be viewed as a weakness or breakdown in the process. Reasons for failure should be identified and the process examined for modification, as appropriate.

b. Maintenance of ship systems and equipment shall be performed by qualified personnel using correct procedures and material in accordance with technical requirements promulgated by the appropriate technical authority. Policy and direction issued by the Fleet Commanders (FLTCs), COMNAVSEASYSKOM, or their subordinate activities shall comply with such technical requirements. FLTCs and COMNAVSEASYSKOM shall ensure procedures addressing deviations to technical requirements are established. These procedures shall:

(1) Ensure that the activity, when finding itself unable to comply with technical requirements, recommends to the appropriate technical authority a repair which the activity considers achievable and which will ensure the needs of the fleet are satisfied.

(2) Differentiate between categories of repair, and identify, by each category of repair, the appropriate technical authority that can authorize deviation from technical requirements.

(3) Ensure work does not proceed until concurrence from appropriate technical authority is received.

(4) Ensure cognizant technical authority revises applicable technical requirements, or documents a deviation from technical requirements, to reflect resolution of the repair.

c. Compliance with quality maintenance requirements will be validated by independent oversight in the form of audits and inspections.

### 3. Responsibilities

a. FLTC. The FLTCs are responsible for safe and effective maintenance of their assigned ships. They shall:

(1) Ensure their Type Commanders (TYCOMs) or other designated subordinate commands utilize approved processes for maintenance.

(2) Ensure all organizational- and intermediate-level maintenance is accomplished in accordance with the cognizant Systems Commander (SYSCOM) technical specifications and requirements. When this requirement can not be satisfied, action shall be taken as outlined in subparagraph 2b.

(3) Maintain positive control over the maintenance practices of subordinate commands to ensure compliance with the standard Navy-wide maintenance policy.

(4) Provide guidance to facilitate the development of joint policy instructions and notes, addressing the following as a minimum:

(a) Administrative requirements.

(b) Organizational- and intermediate-level maintenance activity quality assurance organization and execution requirements.

(c) Responsibilities of organizational- and intermediate-level activity personnel relating to the definition and oversight of maintenance performed by depot activities.

(d) Situational responsibility and accountability guidance.

(5) Assign quality assurance responsibilities.

(6) Advise the Commander, Naval Education and Training Command (COMNETC) and provide guidance to Fleet Training Centers concerning new training requirements identified as a result of work-procedure development, changes in current maintenance performance, and evaluations of maintenance quality problems.

(7) Ensure that Ship Repair Facilities (SRFs) comply with technical and quality requirements promulgated by the Commander, Naval Sea Systems Command (COMNAVSEASYSKOM).

b. COMNAVSEASYSKOM. As the lead systems commander for the life cycle management of ships, COMNAVSEASYSKOM shall:

(1) Develop the technical requirements necessary for performing quality maintenance. This includes issuing and maintaining such technical documentation as current selected record data and Navy equipment drawings, technical manuals, calibration and repair standards, test requirements, and plans, as required.

(2) Identify those systems, portions of systems, or components that, due to their essentiality, complexity, cleanliness or material requirements, must have additional process controls to ensure that technical requirements are met.

(3) Develop and manage special programs to implement additional process controls for those systems and components identified as requiring such.

(4) Provide necessary technical support and oversight of Naval Shipyards (NSYs) and Supervisors of Shipbuilding, Conversion and Repair (SUPSHIPS).

(5) Provide technical support to FLTCs to ensure quality objectives are met.

(6) Ensure all depot-level maintenance is accomplished in accordance with cognizant SYSCOM technical requirements and specifications. When this requirement cannot be satisfied, action should be taken as outlined in subparagraph 2b.

(7) Issue quality assurance policy for NSYs, Ship Repair Facilities (SRFs), and SUPSHIPS for depot-level maintenance.

(8) Assist and advise FLTCs to ensure that guidance

provided in such areas as work-procedure preparation, material requirements and control, work control, testing, and certification instructions are technically correct and consistent with Navy quality objectives.

(9) Advise COMNETC of new training requirements identified with new procedures, systems, or troubleshooting techniques.

(10) Provide Commander, Naval Supply Systems Command (COMNAVSUPSYSCOM) with the following:

(a) Sufficient, accurate, and up-to-date technical information to ensure consistent procurement and control of material that fulfills all technical requirements.

(b) Assistance in the evaluation of discrepancies reported through the Quality Deficiency Report (QDR) Program.

(c) Assistance in determining whether or not the severity of a reported problem warrants purging of supply system stocks. If purging is required, details of the inspection characteristics and methods should be provided, including the scope of the action to be taken.

c. SYSCOMs. Commander, Naval Air Systems Command (COMNAVAIRSYSCOM) and Commander, Space and Naval Warfare Systems Command (COMSPAWARSYSCOM) shall:

(1) Coordinate, with COMNAVSEASYSYSCOM, in the development of technical requirements essential to performing quality maintenance. This includes promulgating and maintaining such technical documentation as current selected record drawings and Navy equipment component drawings, technical manuals, calibration and repair standards, test requirements, and plans, as required.

(2) Identify to COMNAVSEASYSYSCOM those systems, portions of systems, or components that, due to their essentiality, complexity, cleanliness or material requirements, must have additional process controls to ensure that technical requirements are met.

(3) Assist COMNAVSEASYSYSCOM in the development of the additional process controls required to ensure that proper maintenance actions or repairs are performed.

(4) Provide COMNAVSEASYSYSCOM and FLTCs necessary technical



support to ensure that quality objectives are met.

(5) Assist or advise FLTCs to ensure that guidance provided in such areas as work-procedure preparation, material requirements, work control, testing, and certification instructions are technically correct and consistent with Navy quality objectives.

(6) Advise COMNETC of training requirements identified with work procedures, systems, and troubleshooting techniques.

(7) Provide COMNAVSUPSYSCOM with the technical information and assistance outlined in subparagraph 3b(10).

d. COMNAVSUPSYSCOM. COMNAVSUPSYSCOM is responsible for procurement of material in accordance with technical specifications provided by the hardware SYSCOMs. COMNAVSUPSYSCOM shall:

(1) Control material designated by hardware SYSCOMs for special programs such as Level I and Submarine Safety (SUBSAFE) in accordance with cognizant SYSCOM procedures.

(2) Provide or support material control training for those supply personnel who receive, handle, and issue material for designated special programs.

(3) Take action to ensure rapid correction of quality deficiencies as they are identified, utilizing guidance received from the cognizant SYSCOM.

e. COMNETC. COMNETC is responsible for providing effective training in maintenance skills for military personnel in accordance with reference (hh). COMNETC shall:

(1) Emphasize quality maintenance principles in all leadership, management, and maintenance courses.

(2) Develop new quality oriented leadership, management, and maintenance courses as required by FLTCs and SYSCOMs.

(3) Ensure that appropriate shipboard quality assurance fundamentals are included in rate advancement examinations.

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**ACRONYMS**

2M	Miniature/Micro-miniature Electronic Repair
3-M	Maintenance and Material Management System
BFIMA	Battle Force Intermediate Maintenance Activity
CBM	Condition Based Maintenance
CM	Continuous Maintenance
CMP	Class Maintenance Plan
CNO	Chief of Naval Operations
CSMP	Current Ship's Maintenance Project
DMP	Depot Modernization Period
DPIA	Docking Planned Incremental Availability
EOH	Engineered Overhaul
ERO	Engineered Refueling Overhaul
FMA	Fleet Maintenance Activity
FMP	Fleet Modernization Program
FLTC	Fleet Commander
IDTC	Inter-Deployment Training Cycle
ILS	Integrated Logistics Support
ISS	In Service Support
IMA	Intermediate Maintenance Activity
JQR	Job Qualification Requirement
LCM	Life Cycle Management
MARCORSYSCOM	Marine Corps Systems Command
MTR	Module Test and Repair

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NAMTS	Navy Afloat Maintenance Training Strategy
NAVAIRSYSCOM	Naval Air Systems Command
NAVSEASYSCOM	Naval Sea Systems Command
NAVSUPSYSCOM	Naval Supply Systems Command
NRF	Naval Reserve Force
NSA	Naval Supervising Activity
NSY	Naval Shipyard
OPNAV	Office of the Chief of Naval Operations
PEO	Program Executive Officer
PIRA	Pre-Inactivation Restricted Availability
PMS	Planned Maintenance System
RCM	Reliability Centered Maintenance
RMC	Regional Maintenance Center
SHAPEC	Ship Availability Planning and Engineering Center
SPAWARSYSCOM	Space and Naval Warfare Systems Command
SPM	Ship Program Manager
SRF	Ship Repair Facility
SRA	Selected Restricted Availability
SRU	Ship Repair Unit
SUPSHIP	Supervisor of Shipbuilding, Conversion, and Repair
TMA/TMI	Top Management Attention/Top Management Issues
UWSH	Underwater Ship Husbandry

## **LIST OF DEFINITIONS**

**Battle Force Intermediate Maintenance Activity (BFIMA).** The collective battle force elements capable of performing maintenance beyond the organizational level. The function of the BFIMA is to maximize the battle force's ability to operate and sustain itself at sea through improved repair capabilities and material self-sufficiency and strengthen battle force material readiness to conduct Navy/joint/combined operations from the sea.

**Class Maintenance Plan (CMP).** The principal document for executing the approved maintenance program for an aircraft carrier or submarine ship class. Describes all preventive maintenance actions and maintenance support requirements. For surface ships, see Integrated Class Maintenance Plan (ICMP).

**Condition Based Maintenance (CBM).** Maintenance based on objective evidence of actual or predictable failure of ship's installed systems or components.

**Continuous Maintenance.** A process that involves the near continuous flow of work candidates to the most appropriate maintenance level and maintenance activity for accomplishment. Timed to best support operations, it migrates from a centralized time-based batch process to a decentralized condition-based nearly continuous process.

**Core Depot Maintenance.** The capability maintained within organic Defense depots to meet readiness and sustainability requirements of the weapons systems that support the Joint Chiefs of Staff contingency scenario(s). Core depot maintenance capabilities will comprise only the minimum facilities; equipment and skilled personnel necessary to ensure a ready and controlled source of required technical competence. (Reference (w)).

**Corrective Maintenance.** Maintenance actions intended to return or restore equipment to acceptable performance levels.

**Depot-level maintenance.** Maintenance, which requires skills, facilities, or capacities beyond those of the organizational and intermediate levels and is performed by naval shipyards, private shipyards, or item depot activities. Approved alterations and modifications that update and improve the ship's military and technical capabilities are also accomplished.

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**Emergent Maintenance.** Maintenance conducted with little or no notice to restore a failed mission essential system or component to service. This maintenance is normally related to C-3/4 Casualty Reports (CASREPS).

**Engineered Periodicity.** The recommended periodicity for accomplishment of a maintenance action, based upon an engineering analysis of all relevant technical maintenance history information, including material condition and performance feedback data.

**Fleet Maintenance Activity (FMA).** FMAs include tenders, shore based maintenance activities such as Shore Intermediate Maintenance Activities (SIMA), Naval Submarine Support Facilities (NSSF), TRIDENT Refit Facilities (TRF), Weapons Repair Facilities and their supporting activities. Within the limits of each FMA's personnel and facilities, FMAs perform those maintenance functions on hull, mechanical, and electrical (HM&E), and combat equipments and systems, which are beyond the organizational capability or capacity of a ship.

**Integrated Class Maintenance Plan (ICMP).** The principal document for executing the approved Maintenance Program for all surface ship classes. Describes all preventive maintenance actions and maintenance support requirements for the applicable equipment on surface ships.

**Intermediate level Maintenance.** Maintenance requiring a higher skill, capability, or capacity than that of the organizational level. Intermediate level maintenance is normally accomplished by Regional Maintenance Centers (RMCs), Fleet Maintenance Activities (FMAs) afloat (tenders) or ashore (Shore Intermediate Maintenance Activities (SIMAs) or by the Battle Force Intermediate Maintenance Activity (BFIMA).

**In Service Support.** Management and technical support provided between delivery to operational forces and final disposal. This includes maintenance, systems engineering, technical support, configuration management, test and evaluation, and all aspects of integrated logistics support.

**Life Cycle Management.** Management responsibility for a program that encompasses the acquisition program, in service support, and final disposal.

**Maintenance Program.** A Maintenance Program provides top level guidance for a ship class to support maintenance planning objectives sustaining ship material conditions at levels commensurate with the operational tempo throughout its life cycle within existing and projected Fleet resources and infrastructure. The Maintenance Program is developed by the PEO and NAVSEASYS COM for OPNAV Ships' Resource Sponsor approval. It specifies key elements such as depot level availability intervals and durations, frequency of intermediate level availabilities, and any special maintenance, maintenance support, or infrastructure requirements.

**Miniature-Microminiature (2M) Electronic Repair.** The 2M Electronic Repair Program provides the tools, test equipment, documentation and training for the repair of printed circuit boards and electronic/electrical assemblies. This capability is established in ships, at IMAs and shore activities that directly support the fleet. 2M Repair is a core competency of BFIMA/NAMTS.

**Module Test and Repair (MTR).** The MTR Program includes test equipment, training, documentation, and Gold/Silver Disk test procedures to support component level troubleshooting of printed circuit boards and electronic/electrical assemblies. This program is established in ships, at IMAs and in shore activities that directly support the fleet. MTR, combined with microminiature electronic repair, provides intermediate-level repair capability as part of BFIMA.

**Navy Afloat Maintenance Training Strategy (NAMTS).** A training strategy designed to ensure that qualified and proficient craftsman are available to fill the Battle Force Intermediate Maintenance Activity (BFIMA) core billets identified by the Fleet. While BFIMA encompasses all maintenance assets in the battle force, NAMTS focuses on proficiency-based intermediate level maintenance skills and billets in specific areas that the fleet has identified as critical to maintaining self sufficiency.

**Naval Supervising Activity (NSA).** Single naval activity charged with the responsibility of oversight of work being accomplished on U.S. naval ships during any type of availability (i.e. Naval Shipyard (NSY); Supervisor of Ship Building, Conversion, and Repair (SUPSHIP); Ship Repair Facilities (SRFs); and Ship Repair Units (SRUs)).

**Organizational Maintenance.** The lowest maintenance echelon and consists of all maintenance actions within the capability of ship's force, including those actions enabled through BFIMA/NAMTS skill training initiatives.

Typical organizational-level maintenance actions include:

1. Facilities maintenance, such as cleaning and preservation.
2. Routine systems and component preventive maintenance, such as inspections, systems operability tests and diagnostics, lubrication, calibration, and cleaning.
3. Corrective maintenance, such as hull, mechanical, electrical, and electronic troubleshooting down to the lowest replaceable unit level, miniature and micro-miniature (2M) electronic repair, and minor repairs to components to restore operation.
4. Assistance to higher-level maintenance activities as required.
5. Verification and quality assurance of maintenance accomplished by other activities.
6. Documentation of all deferred and completed maintenance actions in accordance with requirements of reference (k).

**Overseas Maintenance Facilities.** Facilities capable of performing intermediate level and most depot level maintenance for ships that are deployed or are in a Forward Deployed Naval Force (FDNF) status. These include Ship Repair Facilities (SRFs) belonging to COMSEVENTHFLT and Ship Repair Units (SRUs) belonging to COMFIFTHFLT/COMSIXTHFLT. Maintenance performed at these facilities must conform with 10 USC Sec. 7310, Restrictions on the Overhaul, Repair, etc. of Vessels in Foreign Shipyards.

**Post Shakedown Availability (PSA).** An availability assigned to newly built, activated, or converted ships upon completion of post-delivery shakedown. Reference (mm) provides guidance on the procedures, scheduling, and durations of these availabilities.

**Preventive Maintenance.** Maintenance actions intended to prevent or discover functional failures.

**Regional Maintenance.** Regional Maintenance concept focuses on realigning the ashore maintenance infrastructure to provide



maintenance support geographically "where the Fleet lives".  
Regional Maintenance objectives are:

- Emphasize process improvements while maintaining customer responsiveness and Fleet readiness.
- Elimination of excess maintenance infrastructure to optimize efficiency.
- Integrated supply support.
- Maintenance cost visibility.
- Compatible maintenance management automated data processing.
- Positive control of technical elements.
- Support depot maintenance core policy.

**Reliability-Centered Maintenance (RCM).** A method, that identifies applicable and effective maintenance tasks, needed to maintain the inherent reliability of systems or equipment at minimum cost. RCM provides the methodology for determining appropriate objective evidence of need. Using RCM principles ensures that a maintenance task is both "applicable" and "effective". RCM-applicable maintenance tasks "apply" to good maintenance program design by maintaining or restoring inherent system or equipment reliability. An RCM-effective maintenance task "pays for itself" in terms of specific failure consequences, safety of personnel, protection of the environment, preservation of mission capability, or minimum life cycle cost.

**Restricted Availability (RAV).** Availability assigned to an industrial activity for the accomplishment of specific items of work while the ship is present and rendered incapable of fully performing its assigned missions and tasks.

**Scheduled Maintenance Requirements.** Those maintenance actions essential to maintaining the system/equipment in a state of operational readiness commensurate with its design. Maintenance tasks, including inspections, failure finding tasks and servicing or lubrication tasks that are scheduled on some recurring basis related to equipment age, such as operating time. Scheduled maintenance is identified, depending on ship type, in the CMP, ICMP, and PMS.

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**Ship Availability Planning and Engineering Center (SHAPEC).**

Process utilized to: Streamline and standardize practices, procedures, and processes to accomplish all I and D Level ship work through:

- Determination of the technical, planning, and material requirements.
- Development of quality standardized reusable planning products required to accomplish that work.
- Centralized data warehousing of planning products for use by all executing activities in accomplishing ship work.

**Shore Intermediate Maintenance Activity (SIMA).** The primary function of a SIMA is to train Sailors in Battle Force Intermediate Maintenance Activity (BFIMA) core skills using the Navy Afloat Maintenance Training Strategy (NAMTS). This primary function of training Sailors applies to all other FMAs when Sailors are assigned. BFIMA/NAMTS relies on skill training and proficiency for enlisted ratings that repair and maintain shipboard systems to ultimately enhance fleet readiness and ship self-sufficiency.

**Technical Availability (TAV).** An availability for the accomplishment of specific items of work by an industrial activity, during which the ship's ability to fully perform its assigned mission and tasks is not affected.

**Time-Directed Preventive Maintenance.** A preventative task performed at some interval without consideration of other variables. This interval may be based on calendar time or the number of recurring events (rounds fired, cycles, starts, stops, etc.). Examples include oil changes, greasing, component software change outs, and periodic checks.

**Voyage Repair (VR) Availability.** An availability solely for the accomplishment of corrective maintenance of mission- or safety-essential items necessary for a ship to deploy or to continue on its deployment. Repairs accomplished during a VR availability are frequently referred to as voyage repairs.